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By GEORGE JOHNSTON, M. D.

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OF
BERWICK-UPON-TWEED.

BY
GEORGE JOHNSTON, M. D.

FELLOW OF THE ROYAL COLLEGE OF SURGEONS; EXTRAORDINARY MEMBER
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VOL. I.
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**HONORARY MEMBER OF THE GEOLOGICAL SOCIETY
OF LONDON, &c.**

THIS WORK IS DEDICATED,

AS A

MARK OF THE RESPECT AND GRATITUDE

OF THE

AUTHOR.

M347862

—“ Si delectamur cum scribimus, quis est tam invidus, qui
ab eo nos abducatur? sin laboramus, quis est, qui alienæ modum
statuat industriæ.”——CICERO.

PREFACE.

It will be obvious, on a cursory examination, that this Work has been the amusement of its Author. Having, on his entrance into business, much unoccupied time, a portion of it could not, he thought, be better employed, than in enlarging that knowledge of Natural History, which, when a student, it had been his duty to acquire, and which has always, and never more so than at the present time, been deemed a necessary part of the education of a physician. For this purpose he began to examine, with some care, the indigenous plants of the neighbourhood, and the catalogue made of his discoveries gradually assumed a form which, he perhaps too fondly believes, may without presumption be submitted to the friends of Botany.

The chief object of the book is to give such a description of the plants growing wild in the vicinity of Berwick, as may enable any one acquainted with the elements of the science, to ascertain the names by which they are known; and it will likewise serve as a guide to conduct the inquirer to the places where the rarer species are to be found. The utility of a work of this kind, consists in its facilitating the investigation of species to those resident within the limits of which it treats, by lessening the objects of comparison; while others may find in it some facts illustrative of the geographical distribution of our

native plants, and of the influence which particular situations exert in producing changes in their appearances.

To relieve, however, the dryness of mere descriptive detail, and to point out the manner in which this study may be made most conducive to our amusement, if not to our instruction, various particulars have been added relative to the uses of our plants in agriculture, in the arts, and in medicine. And, in the Flora of a river, so celebrated as the Tweed in pastoral poetry, and "where flowers of fairy blow," it seemed allowable to notice, at greater length than is usual in works of science, the purposes to which superstition has applied them in former times; and the illustrations which they have afforded to the poets of our own day. A few facts relative to the physiology of vegetable life have been also given; but of what I had collected, by far the greater portion has been cancelled, lest our work should have exceeded its proper limits. I cannot, however, but strongly recommend to the young botanist the attentive observation of such phenomena;—it will add greatly to the pleasure of the walks which he must take in search of the objects of his study, and will remove from him the reproach which has sometimes been cast upon us, of being mere collectors of vegetable curiosities, of which we seemed anxious to know nothing beyond the barbarous name that some dull systematist may have given them. I indeed cannot praise the botanist, who has no other object in his excursions than to add a specimen to his herbarium, and who confines his examination of it to those characters by which he ascertains its name in the system. I know well that such investigations are not void of interest,—it is akin to that which the mathematician feels in the solution of a problem,—but Botany has other

pleasures. There is not a flower which blows but has some beauty only unveiled to the minute inquirer,—some peculiarity in structure fitting it for its destined place and purpose, and yet not patent to a casual glance. Many are full of remembrances and associations, in which it is good for us to indulge. To the student “a yellow primrose on the brim” should be something more than a yellow primrose. He should, to borrow the words of the author of the “Sketch Book,” be continually coming upon some little document of poetry in the blossomed hawthorn, the daisy, the cowslip, the primrose, or some other simple object that has received a supernatural value from the muse. And, as his pursuit leads him into the most wild and beautiful scenes of nature, so his knowledge enables him to enjoy them with a higher relish than others. They are full of his “familiar friends,” with whom he holds a kind of intellectual communion; he can analyse the landscape, and assign to every individual its share in the general effect.

The district, whose native vegetable productions I have attempted to describe, is bounded on the south by a ridge of basaltic rocks, which take their rise at Buddle, and run in a westerly direction to Belford. From this we suppose a line drawn across the elevated moor, until it reaches the river Till, which forms the western boundary, until it joins the Tweed. To the north of this river the political bounds of Berwickshire* are considered those of this Flora; and the sea bounds the whole district on the east.

* It is necessary, however, to remark, that I have had few opportunities of botanizing in the west of Berwickshire. The plants of the Fern Islands, Bamborough Castle, and Cheviot, though a little beyond our limits, are included, as these places are often visited from curiosity.

Within these limits we find soils of every kind and quality. The sea-shore to the south of the river is flat and sandy, interrupted in some places by elevated banks of sandstone, in others by a muddy soil, deposited by the rivulets which terminate there. It is bounded by a narrow stripe of links, formed of sand-knolls, fixed by means of the bent and other plants with creeping roots; and, though barren and waste in an agricultural view, it is rich to the botanist in flowers of great beauty, and not of such commonness as to render them uninteresting. External to this stripe the country is flat, highly cultivated, and, in general, of a productive soil, until we reach, at the distance of three miles or more, the elevated moors which occupy such a large space in the heart of the district. Beyond these the ground rapidly declines, to form the fertile and beautiful vale, through which the Till winds its sluggish course. No part rises to an elevation exceeding 400 feet; nor is it intersected by any river, but a few *burns* run in the ravines, which are numerous and rich in plants. The largest, and indeed the only sheet of water, is the Lough on Holy Island, a place than which no one will more amply gratify the naturalist.

This, the southern half of our district, abounds in coal and lime, which are indeed the prevailing minerals. There is, comparatively speaking, little sandstone; and the chain of rocks which take their rise near Bamborough, and terminate at Kyloe, are trap-rocks, at some places covered with a shallow verdant soil, at others bare, and forming "lofty picturesque cliffs, in their struture approaching the columnar," with more or less of debris at their base*. Such a ridge, as we might anticipate

* For an account of the Geology of Northumberland, I refer to Mr WINCH'S Essay on that subject, and to a paper by Mr TREVELYAN, on the Geognosy of the Coast near Bamborough, in Wernerian Memoirs, vol. iv. p. 253.

affords much interesting scenery, and is favourable to the growth of plants which love a rocky and somewhat alpine situation. There, in particular, we find the Dwarf Cistus evolving its brilliant blossoms in the utmost profusion ;—it is the only station in Northumberland for the not less beautiful Spring Cinquefoil,—the Sea Campion, far from its shore, occasionally reappears here,—and, to omit many enumerated in the subsequent pages, the Ivy and Honeysuckle climb up the columnar rocks, decorating them with verdure and beauty, in return for the shelter and support they receive.

Let us now turn to Berwickshire ;—and of it I feel happy in being able to lay before my readers a very interesting and valuable geological outline, the essay of a much esteemed friend, and the first attempt which has been made to sketch the structure of this county *.

* As an Introduction to this Essay, my friend has remarked, that “ the geographical distribution of plants, their characters, habits, appearances, &c. at different elevations, and the general relation which these bear to the soil, the mineral substances, and general rock formations of the county, or district where they grow, are undoubtedly to be regarded as among the most interesting, as well as important, researches connected with the study of Botany. But until lately, these are views which have been but little attended to ; botanists having been, and still being, too apt to have their thoughts entirely confined to an acquaintance with the plant itself, to the exclusion of any information connected with it,—to content themselves with merely knowing names, number of species, the place these hold in the system, &c.—and to flatter themselves, that if they have succeeded thus far, this is all that is necessary to form a botanist. Whereas, did they view the matter rightly, they would find, that so far from these summing up all that is necessary to be known in botany, they form, in fact, by far the least interesting and important parts of it,—they are little better than the mere elements of the science,—the mere stepping-stones by which to arrive at its real usefulness and importance,—the rude materials (very necessary, indeed, to possess), but which, un-

“ Berwickshire is naturally divided into two great districts, well marked by their difference of external character and surface,—the High and the Low ;—the former comprehending the subalpine districts of Lammermuir and Lauderdale, the latter, which, in an economical point of view at least, is by far the most valuable, as well as beautiful, being named the Merse. The former division forms part of that great hilly range, extending in a S. W. direction from St Abb’s Head to the Solway Frith,—a range which, in different parts of its course, is known under different names, but every where marked by the same great features,—the round-backed shape of the hills, their smooth and unbroken outline, and the thick covering of verdure, which in general reaches to their summits. The latter division again extends from the base of this hilly tract to the banks of the Tweed, which forms the southern boundary, being generally a level, smooth, unvarying extent of country, without any very marked or striking features, save those peculiar to a fertile and well cultivated district.

“ Conformably to this great natural division into high and low country, the geology of Berwickshire, in a general point of view, may, in like manner, be regarded as possessed of only two grand features, and as consisting (principally at least) of only two great rock formations, of very different eras, however, and characters. These are the transition and secondary classes of rocks, the former being those which predominate in the districts of Lauderdale and Lammermuir ; the latter, under the form of the second, or *new red sandstone* formation, being those of which by far the greater part of the Merse is composed. We

less made proper use of, will never lead to any results, either generally interesting, or generally valuable.”

have said that these are the *principal* rocks which we meet with in Berwickshire, for we may now remark, that they are not the only ones,—another distinct formation making its appearance in several different places. This, the first, or *old red sandstone* formation, forming the usual connecting link between the transition and secondary rocks, we meet with in the south-west corner of the county, as at Dryburgh, Merton, &c. There it succeeds immediately to transition-rocks on the west, and is again succeeded in its turn by the second or new red sandstone in the vicinity of Kelso. This formation, however, occurring in small quantity, and so much out of the range of the following Flora, we shall not again refer to it particularly, but proceed, without farther remark, to give a very general description of the two others, noticing, as we go along, as many names of interest as possible, that, by glancing at the habitats assigned to the plants, in another part of these pages, we may at once be able to recognize these spots again, whether as belonging to the one or to the other class of rocks, and at the same time know what are the particular mineral substances which there predominate.

“ Of those parishes within which *habitats* most frequently occur, we remark the following as belonging to the oldest of the two formations, the transition class, viz.: The northern division of the parish of Dunse, the parishes of Abbey St Bathans, Buncle, Cockburnspath, Coldingham, Eyemouth, the greater part of Ayton, and part of Mordington. To the latter division, again, belongs the mouth of the Tweed, and neighbourhood of Berwick, the remaining parts of the parishes of Dunse, Ayton, and Mordington, nearly the whole of Foulden, and the whole of Hutton, Ladykirk, Chirnside, Whitsome, Swinton, Coldstream and Eccles.

“ I shall begin with the first of these, and proceed nearly in the order now mentioned. The northern part of the parish of Dunse extends into the outskirts of the Lammermuirs. These hills, as already mentioned, belong to the transition series, the characterizing rocks of which are greywacke, and greywacke slate*. It is difficult to ascertain whether or not the old red sandstone forms the connecting link between these rocks and the new red sandstone of the Merse; but it is probable, that with minute attention it may be observable†. In this part of our survey, the most striking and important feature of the scenery is Cockburn Law, a beautiful hill about 900 feet above the level of the sea, and equally interesting in an antiquarian, geological, and botanical point of view. The Whiteadder washes the base of this hill, on the northern bank of which, embowered in wood, lies the Retreat, a summer residence of much sweetness and beauty. The fundamental rocks here, as seen on the banks, and in the bed of the Whiteadder, are the greywacke and greywacke slate, but the greater part of the hill itself consists of transition granite, trap, and porphyry. The whole of Abbey St Bathans, the adjacent parish towards the north, we believe to consist of the ordinary greywacke, and its accompanying slate, as also the parish of Buncle, towards the east, where copper has been wrought to a considerable extent, although, we believe, with very little profit to those engaged in the concern. In this part of our course the most interesting

* Greywacke has a basis of clay-slate, and in it imbedded portions of clay-slate, grey quartz, and felspar. Generally, too, there is a good deal of mica in it, especially in the neighbourhood of that part of these hills now noticed. The slate is the same rock, only smaller grained, and having more clayslate.

† The old red sandstone occurs in this manner farther towards the west at Longformacus, and in the neighbourhood of Greenlaw. At the former of these places, it forms the bed of the small river Dye.

botanical habitat is Buncle wood, a tract of ground about 100 acres in extent, and finely varied for the Botanist by smooth green turf, wild moor, and marsh.

“ Proceeding still towards the east by Edincraw and Reston we arrive, after a mile or two, at the beautiful valley, extending, in a northerly direction, from Houndwood to Cockburnspath. The greater part of this valley is watered by the small river Eye ; the whole bed of which, from its rise to its fall, appears to consist of greywacke, and its accompanying greywacke slate, with subordinate rocks of trap. Beds of peat, too, of considerable thickness, occur in the bottom of this hollow, and extend for several miles beyond Houndwood and Renton Inns. The sides of the valley now noticed are lofty, and beautifully adorned, especially on its eastern side, by natural woods and extensive plantations. The rocks are all transition. Towards the northern end we come to the Pease or Peath’s Burn, along whose steep banks, and underneath the magnificent arch of whose bridge we pass, till we arrive, in a short time, at its mouth, and the shores of the German Ocean.

“ From this our course is naturally directed eastward along the coast, the whole line of which, for many miles, is very lofty, naked, and precipitous. Not having examined the whole of it with any thing like minute attention, it may be simply sufficient to mention, that, throughout the greater part of its extent, from this point to the promontory of St Abb’s, the rocks appear to be still greywacke and greywacke slate, the former being frequently broken in pyramids and insulated masses by the violence of the waves, and often exhibiting very curious and singular distortions in position and in stratification. The most interesting and striking object between the two points now al-

luded to, is the ruin of Fast Castle, built on a magnificent cliff overhanging the waves. A little eastward from this, we reach the mouth of a naked, deep, and savage glen, equally interesting to the botanist and geologist; and, after a few additional miles, arrive at the magnificent mountain promontory of St Ebba.

“ Few parts of the kingdom can exhibit a finer and more splendid piece of coast scenery than St Abb’s, to him especially who surveys it from the sea beneath, whether it be in the summer season, when in calmness and security he sails over the peaceful and pellucid waters, amid gloomy caverns, rocky archways, and majestic cliffs, half shattered by the storm or lightning, and shooting up aloft their giant greatness to the skies; or whether he visit it when the myriads of sea-fowl are clothing the lofty cliffs, or darkening with their multitudes the noon-day sun, or filling all the surrounding echoes with their dissonant voices; or whether, when the elements of sea and sky are mingled together, and the waves are lashed up to foam, he sits securely on its mountain-top, and eyes the maddening strife.

“ But it is not for its mere natural scenery that St Abb’s is so interesting—it is, if possible, still more so, in a geological point of view. In a sketch of this description, it may be sufficient to describe St Abb’s as a huge insulated mass of trap rocks, of which the principal are, trap-tuffa, amygdaloid, and felspar porphyry. In the first of these rocks there is generally a basis of clay, with imbedded portions of basalt, amygdaloid and porphyry. In the second rock there is also a distinct basis or ground, generally of a greenish coloured clay, containing amygdaloidal shaped cavities filled with calcareous spar, zeolite, quartz nodules and agates. In the last rock the basis is generally fel-

spar, with imbedded crystals of the same. When these rocks occur in the manner, and with the characters now described, it is usual to consider them as subordinate to the old red sandstone; but where no formation of this kind is observable, and where the rocks within a few yards are evidently greywacke, as they are in the situation now before us, there seems no other way of describing the trap rocks of St Abb's but as subordinate to the transition greywacke and greywacke-slate. We have described St Abb's as an insulated mountain mass, it being completely cut off from the wide extent of high ground towards the west by a deep valley, in the centre of which is a marsh of considerable botanical interest.

“ There are probably few places where the contrast, both in external aspect and in botanical phenomena, as well as in structure, is so remarkable, as it is between the two sides of this valley, especially at the little inlet termed Pettycurwick. Standing by the sea-side at this small creek, and looking westward, we perceive, for many miles along the lofty coast, the most splendid displays of stratification, the strata being of all forms, and in all positions, curved, zigzag, vertical, horizontal, &c.; but the outline both of the summits and the slope of the precipices, we observe, in general, to be smooth and unbroken, and more like a vast sloping wall or mural defence, than a natural piece of rock-scenery. Looking towards the east again, which consists of the high ground of St Abb's, the outline is rugged, broken, and highly picturesque, the sea in that direction being ranged with beetling crags and overhanging cliffs, in one place hollowed out into magnificent caves and natural arches, and, in another, broken into wild and insulated pinnacles. In the botany of the two sides of the valley, we have

also mentioned that there is a difference, and this sufficient to attract the notice even of the most superficial observer. For instance, the *Arenaria verna* grows among the unstratified trap rocks of "the head" in the most beautiful luxuriance, while, on the opposite side of the valley, though the distance in one place be not more than a few yards, not a specimen is to be seen. The *Hypericum humifusum*, again, we observe in considerable abundance on the stratified side, while, on the other, we do not meet with it,—and the same remark I have made in similar situations elsewhere. It may be curious also to observe, that the *Primula elatior*,* as well as the common Cowslip, although abundant among the rocks on the greywacke side, are not met with among those of the opposite side,—a remark which holds good in other parts of the district comprehended in the following Flora.

"Two additional remarks shall conclude our notice of St Abb's. To the most trivial observer, it must be evident that originally St Abb's Head has been an island of the sea, similar to the Bass in the Frith of Forth, or to the rock of Ailsa in the Frith of Clyde; it being quite clear, that the sea, at one time, has flowed through the narrow valley, but has gradually been excluded by the debris falling from each side, which has thus elevated its bottom at either end, and united at length St Abb's to the mainland.

"The other remark relates to the probable origin of that great mass of trap rocks which forms this lofty promontory. It is impossible, we conceive, for any man who knows any thing about rocks at all, to remark the singular position of the greywacke at the little inlet already mentioned, where the two

* Rather a variety of *Primula vulgaris*. See p. 54.

sides of the valley approach nearest (and almost without taking into account any of the other appearances equally conclusive, although not quite so evident), without coming at once to the conclusion, that some prodigious violence must have been necessary to cause the present very singular and distorted aspect of these strata—that this violence must have proceeded from beneath—that these rocks in this manner must have been projected in a liquid form, as lavas—and that thus St Abb's is neither more nor less than an extinct volcano.

“ About a mile and a half south from St Abb's lies the village of Coldingham,—northward and westward from which extends the wide moor of the same name, consisting still of greywacke, as far at least as can be determined from its loose rocks and general outline, for few or no fixed rocks make their appearance. It is a wide and desolate region, but far from being uninteresting, especially in cryptogamous botany. The most striking object in this tract is Coldingham Loch, a very curious and beautiful piece of water, about a mile and a half in circumference, and occupying a very deep hollow in the hills. Coldingham is about a mile distant from the sea, to whose banks we shall again proceed, as it is there that the geology of Berwickshire is both the most interesting and the most apparent. Here, and for several miles, the coast appears to consist of alternations of trap rocks, trap-tuff being the most abundant, and the outline of the coast we find accordingly to be considerably broken and rugged. This rock, very similar to that forming the great central mass of Arthur's Seat, is particularly abundant a little to the north of Eyemouth. Very near this, and forming the bold and projecting point named the Fort, is a very singular and immense bed of conglomerate.

It rests on a rock, which, from its decayed surface, and from being almost always covered with the sea, it is difficult to name, but which has all the appearance of a porphyry, or, at all events, of a trap rock. This conglomerate is composed of rolled masses, generally of a considerable size, and from the neighbouring rocks, cemented by calcareous spar. From the appearances at one or two parts of this headland, it would seem that this immense bed is to be considered as the rudiments of the old red sandstone formation, there being in these parts several rude, but distinct, attempts at stratification, the rock being there of a much smaller texture; and we believe that a coarse conglomerate of this nature is almost always found accompanying the first formation of old red sandstone.

“ This projecting mass forms one side of the small Bay of Eyemouth, which has evidently been formed by the river Eye, which here empties itself into the sea. On the opposite or eastern side of this bay, the greywacke and greywacke slate again commence, and continue several miles, till we reach the fishing-station of Burnmouth. The greywacke, we may remark, is here very fine grained, being almost entirely felspar. Trap, we may also remark, is here rare, never occurring in greater abundance than as an occasional vein, or thin dike, intersecting the strata; and wherever this takes place, we almost invariably behold either a distortion or dislocation of these strata.

“ From Burnmouth to Berwick, the sea-banks exhibit a very different set of rocks from any we have hitherto examined. These are the rocks which form the Second or New Red Sandstone Formation, which here present themselves very

unexpectedly, and resting apparently without any link or connection whatever, immediately on the greywacke. Of these rocks we shall give a very rapid sketch; but previously to doing so, it may perhaps be as well to diverge for a few moments a very little towards the interior, to notice the Hill and Moor of Lamberton, which commence less than half a mile from Burnmouth, and which we remark as the last tract of any consequence, in this direction, appertaining to the Transition series. The high ground now noticed rises almost immediately from the shore to the height of about 300 feet above the sea's level. Generally speaking, it presents a smooth, green outline, with very few projecting rocks. Several small streams produce a variation on its surface, in some places forming narrow ravines, in others marshes.* As far as a very moderate examination has gone, it seems fundamentally to be greywacke, with subordinate beds of porphyry and transition granite or sienite; but from the thick verdure, and the want of naked rocks, it would be very difficult, without most minute inspection, to give any thing like a satisfactory account of the geology of this hill. Looking from the slope of these heights, which overlooks the ocean, we observe far below a broad flat terrace, or tableland, presenting a very abrupt face to the sea. This is part of the New Red Sandstone Formation, which, as we have already said, extends along the whole coast from Burnmouth to Berwick,—a narrow stripe at first, but gradually increasing in

* RAY seems to have found *Tofieldia palustris* by the side of that stream which rises on this hill, and runs by the Shields. The ravine above Burnmouth is one of the most interesting botanical resorts in the neighbourhood. The hill itself is rich in plants; and the vast profusion of *Funaria hygrometrica* and *Didymodon purpureum* in particular places, is worth remarking.

breadth as we approach the mouth of the Tweed. The principal rocks of this Formation (as it occurs in Berwickshire at least) are sandstone and sandstone slate, indurated marl, a coarse kind of limestone, and thick beds of conglomerate. In general appearance, it bears some resemblance, at first sight, to the Coal Formation; but is evidently more recent in its date, and more mechanical in its structure. The predominating and characterizing rock is the sandstone, which is soft, friable, and variegated in its colour. The town of Berwick is built on this formation, and, we believe, what are called the Liberties of Berwick, are all included in it. At the mouth of the Tweed, near Berwick Pier, we have an excellent opportunity of noticing the characters of this formation, the succession of its rocks, and the disposition of its strata. The principal rock there is still the sandstone, containing numerous impressions, principally of tropical plants.* This formation is continued southward under the bed of the Tweed: at a short distance from which, it is succeeded by the Coal Formation of Northumberland.—Ascending the course of the Tweed, we behold, for many miles, on each side of the river, a display of nearly the same rocks as those observed at its mouth, sandstone still being the predominating substance. The sandstone almost always is found forming the bed of the river, the rest of the banks being generally alternations of sandstone slate, indurated marl and conglomerate, the last being of a very recent and mechanical aspect (consisting of the same substances which still compose the channel of the river), and usually oc-

* The coarse limestone, however, consists almost entirely of bivalve shells, echini, and corallines.

curing highest, although frequently this situation is held by the sandstone. In this sandstone numerous vegetable remains occur, and these occasionally of a great size. In quarrying it, the workmen often come to a harder variety, which they term *Bastard Whin*; and numerous circular masses of this description every where present themselves, which seem very like rolled masses of an older date, which have become accidentally imbedded in their present situation, when the sandstone was forming. Calc sinter is the only other substance worth mentioning as accompanying this formation, and that both of an ancient and of a modern date.

“ At the distance of a mile or two from Berwick, we notice the mouth of the Whiteadder, a tributary of the Tweed, the banks of which, for nearly half its course, by Edrington, Foulden, Hutton, Allanton, and Chirnside, exhibit a succession of the self same rocks, except on the banks at Hutton Hall, where we meet with a mineral different from any now noticed, but which, in other parts of the world, sometimes occurs in great abundance in this formation. This is the fibrous gypsum, both the red and white varieties of which occur in the form of numerous thin beds, alternating with the sandstone and marl. Still ascending the Tweed, we pass the fine domain of Paxton, the well-known Chain-bridge a little above it, Norham Castle, Ladykirk, mouth of the Till, and Coldstream—regarding all which places it is unnecessary, in an outline of this description, to say more, than that the self-same rocks, with almost the same characters, and nearly in the same succession, still continue to present themselves.

“ Leaving such details, we conclude the present outline with one or two general remarks. The first regards the situa-

tion which this formation holds, and the relation which it bears to those by which it is bounded. On the N. and NE., as already mentioned, it is bounded by the rocks of the transition series; and on the S., a short way beyond the Tweed, by those of the coal formation. It thus occupies a great hollow or basin between these two formations, lying above coal on the south, and apparently resting immediately on greywacke on the north. On the west it is bounded by rocks belonging to the Old Red Sandstone.

“The second remark regards the probable date or era of this formation. Lying above the coal formation, it is natural to suppose that it must have been formed at a period subsequent to that formation, and this conclusion will be strengthened by an examination of the rocks themselves—their more simple, rude and mechanical aspect—their greater softness and looseness—the similarity of many of them to deposits still forming, together with the difference of contained organic remains—all tending to show that they are newer than the coal formation—that they have been formed more rapidly than the rocks of that series, and when the energies of nature do not appear to have been so high.

“Our last remark regards the probability of coal being found in Berwickshire. Various attempts have been made in different parts of the county to discover this important mineral, but hitherto without success, although the bores in several places, we believe, have exceeded sixty fathoms. Nor is this surprising. Coal, or at least coal fit for use, is not a member of the New Red Sandstone Formation; and although it is a fact, that, in many parts of England, coal is apparently wrought to a great extent in this formation, yet it is not in any part of

it, but in the real coal formation, which lies under, that the coal is found. We do not say, therefore, that coal is not to be found in Berwickshire, as long as we know that it rests towards the south on the coal formation of Northumberland; but the facts now mentioned, should convince those interested in its discovery, that it is in vain to look for it in any part of that formation which covers the low part of Berwickshire—that this formation must previously be completely dug through—that then it must be ascertained whether the next rock be, or be not, an undoubted member of the coal formation; and that until all this be done, the occurrence of coal in Berwickshire must be considered, as of all uncertain things, the most uncertain, and the most problematical.”

The Nomenclature which I have adopted, unless when the contrary is specified, is the same as that of the “English Flora” of Sir J. E. SMITH,—a work which stands unrivalled in this country for the purity and accuracy of its descriptions, and for the interest of its botanical discussions. The *Arrangement of British Plants* by Dr WITHERING, the *Flora Scotica* of LIGHTFOOT and of Professor HOOKER, the *Flora Lapponica*, the *Flora Edinensis* of Dr GREVILLE, the *Botanist's Guide through Northumberland and Durham*, and the *Catalogue of Plants growing in the vicinity of Berwick* by Mr THOMPSON, have been regularly consulted, and whatever information they contained suitable to my purpose, has been borrowed without reserve. A considerable number of extracts has been made

from GERARDE'S *Historie of Plants*, a book in which the botanical student will find much matter of amusement, and sometimes an excellence of description rare even in modern works, though expressed in a quaint manner and antiquated style. Various other works have been resorted to, and if not particularly quoted, the circumstance of their being in common use would rebut the charge of any intentional plagiarism.

To Mr WINCH of Newcastle I am greatly indebted for his communications, and for the liberal manner in which he permitted me to submit to his inspection every species concerning which I could entertain a doubt. I was thus enabled to correct several errors into which I had fallen. In common with all who have attempted to illustrate the natural history of Scotland, I have experienced the kindness of Mr NEILL, of whose remarks I have had frequent occasion to avail myself. To my friends Dr JAMES THOMPSON, now of Jamaica, and WILLIAM BAIRD, Esq. surgeon, my grateful acknowledgments are due for their communications; but in a particular manner they are due to the Rev. A. BAIRD, whose contributions have been numerous and interesting, and with whose company I was favoured in several excursions made from "the love of Nature's works," and in quest of them,—and which, when I see them spread out in the Herbarium, what are they but proofs,

"That man, immur'd in cities, still retains
His inborn inextinguishable thirst
Of rural scenes, compensating his loss
By supplemental shifts, the best he may."

CLASS I.

MONANDRIA.

—“ Thy desire, which tends to know
The works of God, thereby to glorify
The great Workmaster, leads to no excess
That reaches blame, but rather merits praise
The more it seems excess ; * * *

* * * * *

For wonderful indeed are all His works,
Pleasant to know, and worthiest to be all
Had in remembrance always with delight.”

MILTON.

I. MONOGYNIA.

1. SALICORNIA. *Calyx* tumid, undivided ; *corolla* none ; *stamens* 1 or 2 ; *seed* single, invested with the calyx. (Plant leafless, much branched and jointed.)
2. ZOSTERA. *Flowers* aggregate ; *spadix* flat, many-flowered ; *drupa* ; *nut* with one kernel ; *stigmas* 2. (Grass-like ; the flowers all on one side of the spadix, which is contained in the sheaths of the leaves.)
3. CHARA. *Berry* with many seeds ; *style* none. (No calyx no corolla. Aquatic herbs with whorled branches ; no leaves.)

II. DIGYNIA.

4. CALLITRICHE. *Calyx* none ; *petals* 2, inferior ; *seeds* 4, naked, compressed ; some flowers separated. (Inundated or floating herbs, with minute axillary white flowers.)

I. MONOGYNIA.

1. SALICORNIA.

1. *S. herbacea*, stem herbaceous, erect; joints compressed, notched; interstices inversely conical; spikes tapering upward.
Common Jointed-glasswort.

Hab. Muddy sea-shores. Between Goswick Links and Fenham, Thomp. Holy Island. Aug. Sept. ☉

Makes a good pickle, and for this purpose a small quantity is annually sold in our market.

2. ZOSTERA.

1. *Z. marina*, leaves entire, obscurely three-ribbed, grass-like; stems lightly compressed. *Common Grass-wrack.*

Hab. Salt water ditches. Between Goswick Links and the Old Law, Thomp. On the road from Goswick to Holy Island. Aug. ¼.

Said to be excellent for packing glass-bottles and other brittle ware. In some northern parts of Europe, as in Iceland, used for bedding; and of late has been imported in large quantities from the Continent, and is now prepared in this country, for stuffing mattresses, and for the other purposes to which horse-hair is in general applied.

3. CHARA.

1. *C. vulgaris*, striated, without prickles; whorled branches tapering, with internal partitions; bractees four together. *Common Chara.*

Hab. Muddy stagnant ditches, common. July. ☉

Plant nauseously fetid, and incrustated more or less with calcareous earth, which is not accidental, as many have supposed, but an essential and integral part of its constitution. Dr BREWSTER has ascertained that each group or mass of the calcareous matter is held to the stem of the plant by a very fine transparent membrane; and that the minute particles of which each group consists, possess double refraction, and have regular neutral and depolarizing axes. He also found that the plants were phosphorescent when laid upon heated iron, so as to display their entire outlines in the dark.

2. *C. hispida*, furrowed; whorled branches tapering, with internal partitions; bractees whorled; prickles on the stem bristly, deflexed. *Prickly Chara*.

Hab. Lough in Holy Island. July, Aug. ☉

Mr THOMPSON says, that the *Chara flexilis* grows abundantly at the "mouth of the rivulet at Goswick," but we could never find there any other than *C. vulgaris* less incrustated than usual.

II. DIGYNIA.

4. CALLITRICHE.

1. *C. verna*, leaves triple-ribbed, the uppermost crowded, obovate; margin of the seeds obtuse. *Vernal Water-starwort*.

Hab. Ditches and ponds common. May. ☉

The upper leaves are crowded into a star-like form, and float on the surface; but sometimes all the leaves are linear, distant and immersed, a state in which it approaches *C. autumnalis*. It produces seed most profusely when left dry.

2. *C. autumnalis*, leaves linear, abrupt, single-ribbed, uniform; margin of the seeds membranous. *Autumnal Water-starwort*.

Hab. Pools of water in the Vale below Langleyford, with the preceding. June—October. ☉

Grows in a very bushy or cespitose manner. Stems slender, branched. Leaves very narrow, perfectly linear, emarginate at the point, cellular. The upper ones become crowded as they rise to the surface, and somewhat ovate, but, even under a high magnifier, they are all single-ribbed, and notched at the apex.

CLASS II.

DIANDRIA.

—“ With wise intent
The hand of Nature on peculiar minds
Imprints a different bias, and to each
Decrees its province in the common toil.
* * * * *
* * * * * some by the hand
She led o'er vales and mountains to explore
What healing virtue swells the tender veins
Of herbs and flowers.” AIKENSIDE.

I. MONOGYNIA.

* *Flowers inferior, monopetalous, regular.*

5. **LIGUSTRUM.** *Corolla* four cleft; *berry* with 4 seeds.
6. **FRAXINUS.** *Corolla* none, or deeply four-cleft; *capsule* compressed, with 1 or 2 seeds; some flowers without stamens.
- * * *Flowers inferior, monopetalous, irregular, with seed-vessels.*
8. **VERONICA.** *Corolla* wheel-shaped, deeply four-cleft; *capsule* of 2 cells. (Herbaceous; leaves opposite; flowers alternate, mostly blue.)
9. **PINGUICULA.** *Corolla* ringent, spurred; *capsule* of 1 cell; *calyx* five-cleft. (Marsh herbs. Leaves and flower-stalks radical, simple.)
10. **UTRICULARIA.** *Corolla* ringent, spurred; *capsule* of 1 cell; *calyx* of 2 leaves. (Aquatic herbs. Leaves finely divided, bearing bladders.)

* * * *Flowers inferior, monopetalous, irregular, with naked seeds.*

12. *SALVIA*. *Corolla* ringent; *stamens* with a lateral stalk. (Stem square; flowers in whorled spikes.)

* * * * *Flowers superior (racemose.)*

7. *CIRCEA*. *Corolla* of 2 petals; *calyx* in 2 segments; *capsule* of 2 cells; *seeds* solitary.

* * * * * *Flowers apetalous.*

11. *LEMNA*. *Corolla* none; *calyx* of 1 leaf; *capsule* with 1 seed. (A simple frond floating on water, with a central root of one or more fibres, each tipped with a cylindrical cap.)

II. DIGYNIA.

13. *ANTHOXANTHUM*. *Calyx* glume of 2 valves, one-flowered; *corolla* glume of 2 valves, awned; *seed* 1. (A grass.)

I. MONOGYNIA.

5. LIGUSTRUM.

1. *L. vulgare*, leaves elliptic-lanceolate, obtuse, with a small point; flowers in dense panicles, white; berries black. *Privet*.

Hab. Hedges occasionally, and, according to MR WINCH, indigenous on the magnesian limestone in the county of Durham. July.

Makes a neat hedge in gardens, for which this shrub is peculiarly well fitted; since, as RAY observes, “inter omnes frutices, arbores et herbas nihil est quod in tot figuras et elegantias, effingi, flecti, aut formari tondendo queat ac Ligustrum.”

6. FRAXINUS.

1. *F. excelsior*, leaves pinnate, leaflets serrated; flowers without calyx or corolla. *Common Ash*.

Hab. Woods and hedges. May.

A fine tree “far stretching his umbrageous arm,” and remarkable for the manner in which the lower branches curve up at their extremities. When growing near water, it sometimes hangs down its boughs like the weeping-willow. No tree is so often met with in ruins and upon ancient

walls, probably on account of the readiness with which its winged seeds (the *culverkeys* of our pastoral poets) are borne by the wind. It insinuates its roots far into the crevices of these old buildings, and thereby becomes an instrument of the destruction of what affords it support. In like manner it fastens upon loose slaty rocks, and decorates them with its verdure. It is one of the latest trees in coming into leaf, and loses its leaves early in autumn. These are greedily eaten by cattle; and it ought not to be planted in parks or lawns intended for the pasture of milch cows, for they communicate a disagreeable taste to the butter. The wood is tough and valuable, being applicable to a great variety of purposes; and it possesses the very singular property of being in perfection even in infancy,—a pole three inches in diameter being as valuable and durable, for any purpose to which it can be applied, as the timber of the largest tree.

7. CIRCÆA.

1. *C. lutetiana*, stem erect; leaves ovate, slightly toothed, opaque and downy; clusters one or more, of many small white or reddish flowers. *Common Enchanter's-nightshade.*

Hab. Moist shady woods or hedges. Near the Carding-mill at Wooler, Dr J. Thompson. Wooded banks below Langleyford. July. ½

8. VERONICA.

* *Spikes terminal. Root perennial.*

1. *V. serpyllifolia*, cluster terminal, somewhat spiked; flowers pale blue or white, with dark streaks; leaves ovate, slightly crenate, three-ribbed, smooth; capsule inversely heart-shaped, shorter than the style. *Smooth Speedwell.*

Hab. Pastures and road sides, particularly on a clay soil, common. May, June.

* * *Clusters or spikes lateral. Root perennial.*

2. *V. Beccabunga*, leaves elliptical, flat, obtuse; stem creeping, smooth; flowers blue. *Brooklime.*

Hab. Ditches and water-courses, common. June July.

3. *V. Anagallis*, clusters opposite, flowers light blue; leaves lanceolate, serrated, acute; stem erect, smooth. *Water Speedwell.*

Hab. Ditches, frequent. July.

We have gathered specimens upwards of two feet in height, with leaves five inches long and an inch in breadth; while others do not exceed two inches, and have leaves proportionally short and narrow.

4. *V. scutellata*, clusters alternate, flowers pale flesh-colour, streaked; fruit-stalks reflexed; leaves linear, slightly indented; stem slender. *Marsh Speedwell*.

Hab. Bogs and sides of ditches, rare. "Below Calf-hill plentiful," Thomp. Near Mains, Berwickshire, Rev. A. Baird. July, August.

5. *V. officinalis*, flowers light blue, streaked, their stalks shorter than the bracteas; stigma capitate; leaves elliptical, serrated; stem procumbent; plant rough with short hairs. *Common Speedwell*.

Hab. Dry banks, heaths and pastures, common. May, June.

In Sweden, an infusion of the leaves is much used in place of tea; but it is a sorry substitute, notwithstanding that an old Danish botanist has contended for its being the identical tea of China.

6. *V. Chamædrys*, stem diffuse, with a hairy line at each side; leaves ovate, sessile, rugged, deeply serrated; calyx four-cleft, lanceolate; flowers large, bright blue, very beautiful. *Germander Speedwell*.

Hab. Meadows, pastures and hedges, common. May, June.

* * * *Flowers axillary, solitary. Root annual.*

7. *V. agrestis*, stem spreading, branched; leaves ovate, deeply serrated, shorter than the flower-stalks; segments of the calyx ovate; flowers small, bright blue; seeds cupped. *Field Speedwell*.

Hab. Cultivated fields, very common. May—Sept.

8. *V. arvensis*, stem erect; leaves ovate, deeply serrated, the floral ones sessile, lanceolate, entire, longer than the flower-stalks; flowers small, light blue; seeds flat. *Wall Speedwell*.

Hab. On dikes capped with earth, and in dry fields, common. May.

9. *V. hederifolia*, stem procumbent; leaves heart-shaped, flat, five-lobed; segments of the calyx heart-shaped, acute; flowers

pale blue, streaked; seeds cupped, wrinkled. *Ivy-leaved Speedwell.*

Hab. Cultivated fields, very common. May.

The "Mother-of-Wheat" of our husbandmen, a name expressive of a prevalent opinion that this weed will grow freely only on soils well fitted for the cultivation of that grain.

9. PINGUICULA.

1. *P. vulgaris*, nectary cylindrical, acute, as long as the very irregular petal; segments of the calyx oblong; capsule ovate. (Leaves ovate, with involute margins; flowers drooping, purple, palate hairy.) *Butterwort.*

Hab. Marshy places, particularly on moors, common. June. 7

"The husbandmen's wives of Yorkshire," saith GERARDE, "do vse to anoint the dugs of their kine with the fat and oilous iuyce of the herbe Butterwort, when they are bitten with any venomous worme, or chapped, rifted, and hurt by any other meanes." The Laplanders use the leaves to make their *Tætmiølk*, a preparation of milk in common use amongst them. Some fresh leaves are laid upon a filter, and milk, yet warm from the rein-deer, is poured over them. After passing quickly through the filter, this is allowed to rest for one or two days, until it becomes ascendent, when it is found not to have separated from the whey, and yet to have attained much greater tenacity and consistence than otherwise it would have done.

10. UTRICULARIA.

1. *U. vulgaris*, spur conical, upper lip of the corolla the length of the palate, reflexed at the sides; flowers somewhat corymbose, 6 or 8, large, yellow. *Greater Bladderwort.*

Hab. Ditches; in the pond-field above Spindlestone. June, July. 7

A very curious and interesting plant. The stems, about a foot long, lie prostrate in the water, and are beset, at regular intervals, with divided capillary leaves of a vascular structure, and armed with distant minute spines. Attached to the leaves are numerous crested vesicles of a green purple or pink colour, with an aperture closed by a valve, and having its margin armed with a few long spines. These vesicles are filled with water till it is necessary the

plant should rise to the surface, and expand its blossoms in the air. They are then found to contain only air, which again gives place to water when the plant descends to ripen its seeds at the bottom.

11. LEMNA.

1. *L. trisulca*, fronds stalked, proliferous, elliptic-lanceolate, thin, serrate towards the point; roots solitary. *Ivy-leaved Duckweed.*

Hab. Clear still waters, as in the pond at the Grieve's House. June. ☉

2. *L. minor*, fronds obovate, flattish above and beneath; roots solitary. *Lesser Duckweed.*

Hab. Ponds and ditches, common. June. ☉

12. SALVIA.

1. *S. verbenaca*, leaves serrated, sinuated, rugose, the lower ones stalked; bracteas heart-shaped; corolla narrower than the calyx, violet blue. *Wild Clary.*

Hab. Grassy banks. Castle-banks, plentiful, Thomp. The same species, and not *S. pratensis*, as stated by WALLIS, grows sparingly near the ruin of the Abbey in Holy Island, and at Norham Castle. June. ☉

It is remarkable that when the ripe seeds are immersed in water, they speedily swell out to the size of peas or frog-spawn.

II. DIGYNIA.

13. ANTHOXANTHUM.

1. *A. odoratum*, panicle spiked, ovate-oblong, (yellow in age); flowers longer than their awns, on short partial stalks. *Sweet Vernal Grass.*

Hab. Meadows and pastures, very common. May, June. ♀

In drying, this grass exhales the odour of Woodruff, and is one of the chief causes of the fragrance of new meadow-hay.

CLASS III.

TRIANDRIA.

—“ The penetrative Sun,
His force deep-darting to the dark retreat
Of vegetation, sets the steaming power
At large, to wander o'er the vernal earth,
In various hues; but chiefly thee, gay Green!
Thou smiling Nature's universal robe!
United light and shade! where the sight dwells
With growing strength, and ever-new delight.”

THOMSON.

I. MONOGYNIA.

* *Flowers superior.*

14. VALERIANA. *Corolla* 5-cleft, protuberant at the base; *seed* 1, with a feathery radiating crown.
15. FEDIA. *Corolla* 5-cleft, protuberant at the base; *capsule* crowned with the toothed calyx, without valves, of 1-3 fertile cells; *seeds* solitary.
16. IRIS. *Corolla* in six deep unequal segments, alternately reflexed; *stigmas* two-lipped, like petals. (Leaves sheathing, sword-shaped.)

* * *Flowers inferior, chaffy. Seed* 1. (*Rush or grass like plants.*)

17. SCHÆNUS. *Corolla* none; *spike* of very few flowers; *glumes* 2-ranked, with many smaller empty external ones; *style* simple at the base, deciduous.

18. *SCIRPUS*. *Corolla* none; *glumes* imbricated all round, uniform, concave, expanded; *style* simple at the base, deciduous.
19. *ELEOCHARIS*. *Corolla* none; *glumes* imbricated all round, uniform, expanded; *seed* crowned and articulated with the dilated hardened base of the style.
20. *ERIOPHORUM*. *Corolla* none; *glumes* imbricated all round, uniform, expanded; *seed* subtended by numerous very long hairs.
21. *NARDUS*. *Corolla* of 2 valves; *calyx* none.

II. DIGYNIA.

(TRUE GRASSES.)

* *Flowers dispersed. Calyx of 2 or 3 valves, with a solitary floret.*

24. *ALOPECURUS*. *Calyx* of 2 valves; *corolla* of 1 valve, simple at the summit, awned at the base; *styles* combined.
23. *PHLEUM*. *Calyx* of 2 close parallel pointed valves, concealing the *corolla* of 2 awnless valves; *seed* loose.
22. *PHALARIS*. *Calyx* of 2 close parallel valves, concealing the double *corolla* of 3 or 4 valves, 2 innermost downy, subsequently hardened, investing the seed.
25. *AGROSTIS*. *Calyx* of 2 acute valves shorter than the *corolla*, which is membranous, tufted with hairs at the base, unchanged; *seed* loose.

* * *Flowers dispersed. Calyx of 2 valves containing 2 or 3 florets.*

26. *AIRA*. *Florets* 2, without any intermediate rudiment; *seed* loose; *corolla* unchanged.
28. *MELICA*. *Florets* 1 or 2, with the rudiments of 1 or 2 intermediate ones; *seed* coated with the hardened *corolla*.
27. *HOLCUS*. One *floret* barren; *corolla* awned; *seed* coated with the hardened *corolla*; *calyx* keeled.

* * * *Flowers dispersed. Calyx containing many florets.*

32. **BRIZA.** *Corolla* awnless, tumid, expanded, concave, without a keel; *seed* depressed, united to the corolla.
30. **POA.** *Corolla* awnless, compressed, keeled, ovate, acute; *seed* loose, elliptic-oblong.
29. **GLYCERIA.** *Corolla* awnless, cylindrical, furrowed, ribbed, abrupt, not keeled; *seed* loose, cylindric-oblong.
31. **TRIODIA.** *Corolla* orbicular, expanded, obscurely ribbed, deeply cloven with an intermediate point; both valves concave; *seed* loose, depressed.
33. **DACTYLIS.** *Corolla* awned at the summit, lanceolate, keeled, compressed, inner valve folded, 2-ribbed; *seed* loose, oblong; *calyx* compressed, taper-pointed, unequal.
35. **FESTUCA.** *Corolla* awned at the summit, or pointed, keeled, nearly cylindrical, concave, inner valve flat, 2-ribbed, downy at the ribs; *seed* loose, oblong; *calyx* concave, acute, very unequal.
34. **CYNOSURUS.** *Corolla* awned at the summit, lanceolate, keeled, concave, inner valve flat, 2-ribbed; *seed* loose, elliptic-oblong; *calyx* awned, equal; *spikelets* in pairs, 1 entirely neuter.
36. **BROMUS.** *Corolla* awned at the back, cloven, concave, inner valve flat, 2-ribbed, bristly at the ribs; *seed* elliptic-oblong, united to the inner valve.
37. **AVENA.** *Corolla* awned at the back, cloven, nearly cylindrical, inner valve flat, ovate; *seed* elliptic-oblong, united to the hard outer valve.
38. **ARUNDO.** *Corolla* surrounded with long permanent hairs; *florets* 1 or many.
- * * * * *Flowers aggregate, on a jointed or toothed common stalk with lateral excavations.*
39. **LOLIUM.** *Calyx* of 1 principal valve opposite to the stalk, fixed, many-flowered.

41. *TRITICUM*. *Calyx* of 2 transverse opposite valves, solitary, many-flowered.

40. *HORDEUM*. *Calyx* of 2 parallel valves, aggregate, ternate, with 1 floret; central *flower* only perfect.

III. TRIGYNIA.

42. *MONTIA*. *Calyx* of 2 leaves; *corolla* monopetalous; *capsule* with 3 valves and 3 seeds.

I. MONOGYNIA.

14. VALERIANA.

1. *V. dioica*, radical leaves ovate; stem a span high, its leaves pinnatifid; flowers diœcious, flesh-coloured. *Marsh Valerian*.

Hab. Marshy meadows, frequent. June. ♀

2. *V. officinalis*, stem 3 or 4 feet high; leaves all pinnate, leaflets lanceolate, nearly uniform, serrated; flowers blush-coloured, in large corymbose panicles. *Wild Valerian*.

Hab. Sides of water-courses and marshy places, frequent. July. ♀

The root, particularly when the plant grows in dry places, has a very peculiar disagreeable odour, and affords a medicine of considerable value. Cats are so fond of it as to be almost intoxicated by it into outrageous playfulness.

15. FEDIA.

1. *F. olitoria*, stems a span high, dichotomous; leaves linear-tongue-shaped, blunt; flowers capitate, pale blue; capsule inflated, two-lobed. *Lamb's Lettuce*.

Hab. Light rather sandy soils. Castle-hills. Ravine at Burnmouth; but most abundant below the Union Bridge, and about Warren. May. ☉

Has been long known and used as a salad herb, and lately as an excellent vegetable dish for the table, dressed in the manner of spinage. A small bed of rich garden-earth sown with the seeds in August, or in the end of July, will supply an excellent portion of salad throughout the winter until April, the season when other salads are not to be had.

16. IRIS.

1. *I. pseudacorus*, corolla beardless, inner segments smaller than the stigmas; seeds angular. *Yellow Iris*.

Hab. Sides of ponds and marshes, common. July. 7/

The roots, in Arran, are used to dye black; in Jura, boiled with copperas to make ink. They are strongly purgative, and said to be particularly useful in dropsical complaints. Formerly recommended as a cure for toothache. "But above all," says ETTMULLER, "which I have hitherto known, the juice of the root of the *Iris lutea* rubbed upon the tooth that is painful, or the root itself chewed in the mouth, in an instant, as if by a charm, drives away the pain of the teeth arising from what cause soever. He that communicated it to me, affirms that he had tried it forty times at least, with like success: I myself also have various times tried it, and a great many others have done the same by my persuasion, and I hardly ever knew it fail."—The seeds roasted make excellent coffee, superior to any other substitute.

17. SCHÆNUS.

1. *S. nigricans*, stem a foot high, round, naked; head roundish, abrupt, overtopped by one of the two floral leaves. *Black Bog-rush*.

Hab. Moors and boggy places, frequent. Field west of the Steps-of-Grace farm-house, Thomp. Below the Old Lamberton toll. Lamberton Moor, &c. June. 7/

18. SCIRPUS.

" *Spikes solitary, terminal.*

1. *S. cæspitosus*, stems tufted, 6 inches high, round, striated, sheathed and invested with numerous scales at the base; spike small, brown; outer glumes as long as the spike, pointed. *Scaly-stalked Club-rush*.

Hab. Abundant on all our moors, and in spring a principal food of Highland sheep. July. 7/

2. *S. pauciflorus*, stem round, with a tight leafless sheath at the base; spike ovate, naked; glumes obtuse, with membranous

edges, the two outer the largest, but shorter than the spike.
Chocolate-headed Club-rush.

Hab. In a bog in the field adjoining Spring Gardens. Aug.
24

3. *S. fluitans*, stem branched, leafy, pliant and floating; flower-stalks alternate, naked; spikes of few flowers, with obtuse greenish glumes; stigmas 2. *Floating Club-rush.*

Hab. Pools and ditches. "Moor west of Belford plentiful,"
Thomp. July. 24

* * *Stem round, with several spikes.*

4. *S. lacustris*, stem 4 to 6 feet high, naked; pannicle cymose, twice compound, terminal; spikes ovate; bracteas generally much shorter than the panicle. *Bull-rush.*

Hab. Sides of rivers and ponds. Whiteadder, particularly near its junction with the Tweed, Thomp. July. 24

The stems are much used for making mats, chair-bottoms, and for thatching.

5. *S. setaceus*, stems tufted, 3 inches high, bristle-shaped, leafy at the base; spikes about 2, sessile, surmounted by a leafy bractea; seed furrowed, without bristles. *Bristle-stalked Club-rush.*

Hab. Wet gravelly places, frequent on moors. Bog below Shoreswood-hall. Haidendean, Dr Thompson. Lamber-ton Moor, &c. July, August. ☉

6. *S. caricinus*, stem roundish, leafy at the bottom; spikes ag-gregate, two-ranked, many-flowered; leaves flat, with rough edges and keel; seed with six bristles at the base. *Compressed Club-rush.*

Hab. Boggy meadows. "Links near Bamburgh," Winch. Near the style below Gallowshill, Thomp. Above the Coves in Holy Island. July. 24

Root creeping. Stems from 4 inches to upwards of a foot in height, simple, smooth, rounded until within an inch or two of the spikes, when it becomes suddenly triangular. Leaves grass-green, shorter than the stem, sheathing, channelled, the upper frequently plane, smooth and un-keeled on their lower part, becoming keeled and triang-ular upwards; the keel and edges rough. Lower bracteas foliaceous, shorter or longer than the spikes, which are 2-ranked, of a brown colour. The seed is triangular, with a long slender beak, and several long hairs at the base.

* * * *Stem triangular. Panicle leafy.*

7. *S. maritimus*, stem 1 to 3 feet high ; panicle terminal ; spikes conglomerate ; glumes torn, with an intermediate point ; stigmas 3. *Marsh Club-rush.*

Hab. Salt marshes. Mouth of the Whiteadder ; Yarrow Haugh ; below Brock's Mill ; "Coast near Beaf," Thomp. July, Aug. 7/

8. *S. sylvaticus*, stem about 3 feet high, leafy throughout ; panicle terminal, cymose, repeatedly compound ; flower-stalks sheathed at the base ; spikes aggregate, small. *Wood Club-rush.*

Hab. River sides above the Union Bridge, plentiful. July. 7/

19. ELEOCHARIS.

1. *E. palustris*, root creeping ; stems round, leafless, sheathed at the base, a span high ; spike oblong, naked ; stigmas 2 ; seed lenticular, most convex at one side. *Creeping Spike-rush.*

Hab. Marshy places, and at the sides of rivers and ponds, common. June, July. 7/

20. ERIOPHORUM.

* *Spike solitary.*

1. *E. vaginatum*, stem triangular above, round below with a swelling sheath ; spike ovate ; glumes membranous. *Hare's-tail Cotton-grass.*

Hab. Turfy boggy heaths. Below Shoreswood Hall, Dr Thompson. Murton Craigs ; and common on our more elevated moors. April. 7/

* * *Spikes several.*

2. *E. polystachion*, stem round ; leaves flat, lanceolate, with a triangular point ; stalks of the spikes smooth ; hairs thrice the length of the spike. *Broad-leaved Cotton-grass.*

Hab. Boggy meadows, not common. Below Allerton Mill, plentiful ; in a field east of Easington House, below Belford, now ploughed out. April. 7/

Root fibrous. Stem 2 feet high, soft, smooth, leafy, round, obtusely triangular upwards, sometimes much compressed.

Radical leaves numerous, longer than the stem when in flower, and very little shorter even when in seed, broad, with a long triangular roughish point. Stem leaves several, very long, with smooth sheaths. Spikes numerous, on long flattened smooth stalks, drooping, overtopped by a long foliaceous bractea.—The stem may be said to be often branched, that is, in many specimens 1 or 2 long stalks arise out of the sheaths of the leaves, and bear each a spike of flowers.

3. *E. pubescens*, stems angular; leaves flat, lanceolate, with a triangular point; stalks of the spikes downy; hairs twice the length of the spike. *Downy-stalked Cotton-grass*. (*E. polystachion*, Winch. Guide, i. 6; Greville, Flor. Edin. 13.)

Hab. Bogs and marshes, frequent; Castle-hills; field below the Old Lamberton Toll; Lamberton Moor, &c. June. 74

Root fibrous. Stem 12–18 inches high, smooth, striate, hollow, obtusely triangular at the base, more acute upwards. Leaves all short, broad, rough on the edges and keel, with a short triangular point; the radical ones tufted, decaying soon; the cauline from 2 to 4, alternate, 2 or 3 inches long, with smooth sheaths as long as themselves. Stipula very minute, rounded, entire. Lower bractea shorter than the spikes when in seed, blackish at the base, many-ribbed, with a brown triangular point. Spikes 5 or 6, the central one largest and sessile, the others on furrowed stalks, covered with a short rough down. Glumes blackish, greenish-yellow at the base, ovate-lanceolate, 1 or 3-ribbed, membranous at the margins. Seed obovate, triangular, brown. Hairs very white and silky.

4. *E. angustifolium*, stem nearly round; leaves linear, triangular, channelled towards the base; stalks of the spikes smooth; hairs four times the length of the spike. *Common Cotton-grass*.

Hab. Bogs, particularly on moors, very common. April. 74

There has existed much confusion relative to these three species, and yet no plants can be more distinct. The latter may always be known by its numerous very narrow leaves, as long as the flowering stem, which in fruit, however, rises considerably above them; and the stem-leaves are few and short. In the *E. polystachion* they are much broader, those of the stem much longer, and the plant itself more succulent, robust, and leafy; while its more numerous spikes are pendant on longer, sometimes branched,

stalks. As for *E. pubescens*, it can never be mistaken, if we attend to the short rather broad leaves, and to the furrowed downy flower-stalks.

21. NARDUS.

1. *N. stricta*, spike bristle-shaped, straight, the florets all pointing one way. (A rigid wiry grass growing in tufts.) *Common Mat-grass*.

Hab. Moors and heaths abundant. July. 74

II. DIGYNIA.

22. PHALARIS.

1. *P. canariensis*, panicle ovate, resembling a spike; calyx glumes boat-shaped, entire at the summit; outer corolla of two naked valves. *Canary-grass*.

Hab. Cultivated and waste grounds, certainly not indigenous, and in no fixed station. July. ☉

One to 2 feet high, glaucous; spike variegated with green and white,—a beautiful grass, often cultivated in gardens for the sake of the seeds, which are given to Canary birds.

2. *P. arundinacea*, panicle upright with spreading branches; flowers crowded, unilateral; outer corolla of two bearded valves. *Reed Canary-grass*.

Hab. Margins of rivulets and ponds frequent. July, Aug. 74

Stem 4 feet high, reed-like. Common in gardens, with variegated leaves, and known by the popular name of Gardeners' Garters.

23. PHLEUM.

1. *P. pratense*, cluster spiked, cylindrical; calyx abrupt, fringed at the keel, longer than its awns. (1 to 2 feet high; spike 1-5 inches long, compact.) *Common Cat's-tail-grass*.

Hab. Moist meadows and pastures, common, June-Oct. 74

Hares are remarkably fond of this grass, and it is eaten without reserve by cattle in general. It produces early in

spring an abundance of fine foliage; but, though once celebrated for its agricultural merits, under the name of Timothy-grass, is now comparatively neglected.

2. *P. arenarium*, spike slightly paniced, ovate-lanceolate, obtuse; calyx-glumes lanceolate, fringed, thrice the length of the abrupt notched corolla. Stems several, 3-6 inches high. *Sea Cat's-tail-grass*.

Hab. Common on the sandy sea coast, Winch. Holy Island.
May. ☉

24. ALOPECURUS.

1. *A. pratensis*, stem erect, smooth, $1\frac{1}{2}$ to $2\frac{1}{2}$ feet high; spike somewhat paniced, 2 inches long, thick, soft; calyx-glumes acute, hairy, combined at the base, shorter than the awn of the corolla. *Meadow Fox-tail-grass*.

Hab. Meadows and pastures common. May. ♀

An early and very productive grass. It grows naturally in a moist soil, and is hence best adapted to improve very wet ground, that may be drained of superfluous moisture, or to form or ameliorate meadows that have a moist bottom, and are not apt to be burnt up in dry summers.
CURTIS.

2. *A. geniculatus*, stem ascending, bent at the joints; spike cylindrical, slightly paniced; calyx-glumes combined at the base, abrupt, fringed; corolla notched, its awn twice the length of the calyx. *Floating Fox-tail-grass*.

Hab. Wet meadows and marshy places. July, Aug. ♀

25. AGROSTIS.

1. *A. vulgaris*, stem erect, 12-18 inches high; stipula abrupt, very short; panicle purplish, spreading, with divaricated capillary branches; corolla with or without a dorsal awn; calyx-valves nearly equal. *Fine Bent-grass*.

Hab. Meadows and pastures. July, Aug. ♀

Forms the turf of Murton Moor, and similar sheep-walks. For grass-plats and lawns considered by CURTIS the best of our English species, being of ready growth, bearing the scythe well, producing fine foliage, and resisting drought better than most.

2. *A. alba*, stem spreading, creeping; stipula oblong, ribbed; panicle condensed at the base of the main divisions, stalks rough; calyx-valves lanceolate, bristly at the keel; corolla rarely with a short awn. *Marsh Bent-grass*.

Hab. Moist meadows and road sides. At the side of the canal below New-water Haugh, and in other inland situations, the specimens answer exactly to the description of the *A. alba* in *Flor. Brit.*; but along our shores, where it grows abundantly in wet clayey spots, the panicle is more dense, the branches being not at all spread out, a variety which constitutes the *A. stolonifera* of the same work. July, Aug. 7/

This is the *Fiorin-grass* of Dr RICHARDSON, and the Irish agriculturists, but has never been cultivated to any extent in this country. To be in perfection, it requires a moist climate or a wet soil, and it grows luxuriantly in cold clays unfitted for other grasses. In light sands, and in dry situations, the produce is much inferior both as to quantity and quality.

26. AIRA.

* *Corolla awnless.*

1. *A. cristata*, panicle spiked, lanceolate; calyx longer than its flower-stalk, shorter than the florets; glumes all pointed. (A span high.) *Crested Hair-grass*.

Hab. Dry elevated pastures not uncommon. About Genesis Gull-hole, Thomp. Links at Holy Island, Winch, Banks beyond Spittal, and opposite Spring Gardens, &c. July. 7/

2. *A. aquatica*, panicle spreading; florets even, obtuse, longer than the calyx; leaves flat, stipula oblong; stems floating. *Water Hair-grass*.

Hab. Ditches and watery places not uncommon. In a ditch below Calf-Hill, Thomp. Common about Ord; Tweed-mouth Fields; Banks beyond Spittal. June. 7/

* * *Corolla awned.*

3. *A. cæspitosa*, panicle spreading, very large; florets about the length of the calyx, abrupt, hairy at the base, one of them on a

hairy stalk; awn short, from the base of the outer valve; leaves flat; stems 3 feet high. *Turfy Hair-grass*.

Hab. Rough bogs and moist shady places, common. July.
 74

4. *A. flexuosa*, panicle spreading, triple-forked, with wavy branches; florets about the length of the calyx, acute; awn from the middle of the outer valve, longer than the calyx, twisted; leaves bristle-shaped; stems 12–18 inches high. *Waved Hair-grass*.

Hab. Heaths and hilly places common. July. 74

5. *A. præcox*, panicle close, erect; florets the length of the calyx, both sessile; awn nearly twice as long, from the base of the valve; leaves bristle-shaped, with angular sheaths; stems 2 or 3 inches high. *Early Hair-grass*.

Hab. Dikes capped with earth, and barren heaths, common. May, June. ☉

6. *A. caryophyllea*, panicle spreading, triple-forked, silvery grey; florets not longer than the calyx, both sessile; awn twice as long, from above the middle of the valve; leaves bristle-shaped with ribbed close sheaths; stems a span high. *Silver Hair-grass*.

Hab. Gravelly hills and pastures frequent. June, July.
 74

None of the *Airæ* are cultivated, and they contribute but little to the verdure of meadows or pastures. Some of them (2, 3, 4,) possess a considerable degree of elegance, and are often gathered for the purpose of ornamenting fire-places during the summer.

27. HOLCUS.

1. *H. lanatus*, root fibrous; stem about 2 feet high; leaves downy on both sides; calyx woolly; lower floret perfect, awnless; upper with an arched awn. *Meadow Soft-grass*.

Hab. Meadows and pastures abundant, but apparently not agreeable to cattle. June, July. 74

2. *H. mollis*, root creeping; stem 2 feet high; leaves slightly downy; calyx partly naked; lower floret perfect, awnless; upper with a sharply bent prominent awn. *Creeping Soft-grass*.

Hab. Hedges and shady places ; occasionally amongst corn. Redpath Fields, Dodd's Well, &c. Thomp. July, Aug. 74

3. *H. avenaceus*, root knotty ; stem 3 feet high ; leaves rather harsh ; calyx smooth ; barren floret lowest, with a sharply bent prominent awn ; fertile one slightly elevated, scarcely awned.
Oat-like Soft-grass.

Hab. Sides of ditches, and in moist corn-fields : a troublesome weed in many farms in this neighbourhood. July.
74

28. MELICA.

1. *M. uniflora*, petals beardless ; panicles branched, drooping toward one side ; flowers erect ; spikelet with only one perfect floret. Stem 18 inches high. *Wood Melic-grass.*

Hab. "Ash-wood, Belford." Thomp. June. 74

2. *M. cœrulea*, petals beardless, acute ; panicle close, erect, compound ; flowers upright, cylindrical. *Purple Melic-grass.*

Hab. Bogs, and on moors, common. Aug. 74

A hard coarse reedy grass, 1 to 2 feet high, remarkable from its purple panicle. In some parts of England brooms are made of the stems ; and the fishermen in Skye make ropes of them, which they find, by experience, will bear the water well, without rotting.

29. GLYCERIA.

1. *G. fluitans*, panicle oblong, branched, divaricating ; spikelets close-pressed ; florets numerous, obtuse, seven-ribbed, with short intermediate ribs at the base ; nectary obtuse, tumid. *Floating Sweet-grass.*

Hab. Ditches and stagnant waters, common. July, Aug.
74

A large thick and succulent grass, with long leaves ; when not in flower, floating on the surface of the water, but the flowering stems are erect. The seeds, under the name of Manna croup, are sold in our shops, and employed occasionally as a nourishing mild diet. They are said to be very sweet, especially before arriving at maturity.

2. *G. maritima*, panicle branched, rather close, erect after flowering; florets about 5, somewhat pointed, slightly 5-ribbed; root creeping. *Sea Sweet-grass*.

Hab. (1.) Sides of the Tweed above the Bridge; shores of Holy Island, abundant. (2.) St Abb's Head, and on the sea-shore from that to Redheugh. July. 7/

It appears to me that there are two very distinct varieties of this plant. When it grows in wet situations, (1.) The root is fibrous, and the foliage is large, soft, straight, and only slightly glaucous. This is well described in RAY's Syn. 409-10, No. 6.; and is the state of it which may have induced LIGHTFOOT to believe it a variety of the *G. fluitans*, for, like that species, the stems, in autumn, often extend to upwards of a foot in length, and float upon the water. When, on the contrary, it grows on dry stony situations, (2.) The root becomes creeping, the leaves are rigid, generally curved, and very glaucous. HOOKER's description is very characteristic of this state, Fl. Scot. i. 23, which is clearly the "*gramen caninum maritimum paniculatum*" of RAY, Syn. 410. No. 7. The species has cost me some trouble, and had it not been for the guidance of Mr WINCH, I would have considered the first as *G. procumbens*, and the second as the true *maritima*.

3. *G. procumbens*, panicle lanceolate, unilateral, 2-ranked, close, with rough stalks, the main one cylindrical; florets about 5, bluntish, 5-ribbed; (root fibrous, plant glaucous and rigid.) *Procumbent Sweet-grass*.

Hab. "Some of the larger islets (Farn Islands) are covered with vegetable mould, producing a plentiful crop of *Poa (Glyceria) maritima* and *procumbens*," P. J. SELBY, Esq. Zool. Journ. ii. 454. July, Aug. ☉

4. *G. rigida*, panicle lanceolate, unilateral, two-ranked, close, with smooth stalks, the main one bordered; florets about seven, acute, scarcely ribbed. *Hard Sweet-grass*.

Hab. "Heugh, Holy Island, plentiful," Thomp. June. 7/

Stems several, 3-5 inches high, peculiarly rigid and wiry, as is also the not inelegant panicle.

30. POA.

1. *P. trivialis*, panicle spreading ; spikelets 3-flowered ; florets lanceolate, 5-ribbed, connected by a web ; stipula oblong ; stem and leaves roughish ; root fibrous. *Roughish Meadow-grass.*

Hab. Meadows and pastures. June–Oct. ¼

In moist rich soils one of the most valuable grasses, whether for pasturage or hay ; its produce and nutritive powers being both very great.

2. *P. pratensis*, panicle spreading ; spikelets 4-flowered ; florets lanceolate, 5-ribbed, connected by a web ; stipula short and obtuse ; stem and leaves smooth ; root creeping. *Smooth Meadow-grass.*

Hab. Meadows and pastures. The *P. subcærulea* of Eng. Botany, a variety of the present species remarkable for the glaucous hue of its whole herbage, grows abundantly in Yarrow Haugh, and on the Farn Isles, according to my friend Dr THOMPSON. June, July. ¼

As an object of agriculture this is not less valuable than the preceding. It is earlier in leaf, and will thrive with less moisture, but is said to exhaust the soil in a much greater degree. The roots are numerous and creeping, and become in two or three years, especially in a dry soil, so matted together, that the ingress of nourishment is hindered, and the produce gradually diminished.

3. *P. annua*, panicle widely spreading ; spikelets ovate, 5-flowered ; florets a little remote, 5-ribbed, without a web ; stems oblique, compressed ; root fibrous. *Annual Meadow-grass.*

Hab. Meadows and pastures, waste and cultivated ground, very common. April–Nov.

31. TRIODIA.

1. *T. decumbens*, panicle nearly simple, close, erect ; florets 4, their middle tooth shortest ; calyx smooth ; stipula hairy. (One foot long, procumbent, flowering stem only erect ; leaves linear, rigid, acuminate, hairy as well as the sheaths.) *Decumbent Heath-grass.*

Hab. Dry mountain pastures, frequent. Sea-banks from the Burgesses' Cove northward ; banks beyond Spittal ; Murten Craigs, Thomp. July. ¼

32. BRIZA.

1. *B. media*, spikelets ovate, about 7-flowered; calyx shorter than the florets; stipula very short and blunt. *Common Quaking-grass.*

Hab. Barren fields, heaths and bogs, common. June. ½

33. DACTYLIS.

1. *D. glomerata*, panicle distantly branched; flowers in dense globular tufts, unilateral; corolla somewhat awned, 5-ribbed, taper-pointed. *Rough Cock's-foot-grass.*

Hab. Meadows and shady places, common. June, Aug. ½

A coarse grass growing in tufts, yet has been recommended as a substitute for rye-grass, and tried, apparently with great success, by Mr COKE of Holkham. To reap the benefit of its merits, it must be sown on dry open land, and kept closely cropped either with the scythe or by means of cattle.

34. CYNOSURUS.

1. *C. cristatus*, spike simple, linear, unilateral, about 2 inches long, with a wavy rough stalk; neuter spikelets without awns; stems slender, 12–18 inches high. *Crested Dog's-tail-grass.*

Hab. Dry pastures very common, and valuable. June, July.

35. FESTUCA.

1. *F. ovina*, stem square, 6 to 12 inches high; leaves folded, bristle-shaped, with a short obtuse stipula; panicle unilateral, rather close; florets cylindrical, pointed or awned, smooth at the base and at the edges of the inner valve. *Sheep's Fescue-grass.*

Hab. Forms the finest turf of our dry hilly pastures, and is seldom or never found intimately mixed with other grasses. June. ½

2. *F. vivipara*, stem square; leaves folded, bristle-shaped, smooth; panicle unilateral, rather close; florets compressed, keeled, awnless, somewhat downy, as well as the edges of their inner valve and the calyx. *Viviparous Fescue-grass.*

Hab. Summit of Cheviot, Dr Thompson. July. ½

Considered by many a mere variety of the preceding, and, if so, it affords a good example of the provident economy of Nature in modifying her productions, so as to fit them to their peculiarities of situation. For when the Sheep's Fescue-grass grows in a vale, or upon a plain, its seeds ripen, fall and vegetate in the manner of other plants; but when it grows upon the tops of mountains, where it finds a difficulty in ripening its seeds, it becomes a viviparous plant. The germ shoots into blade in the cup, falls to the ground, takes root, and becomes the mother of others, having the same remarkable property.

3. *F. duriuscula*, root fibrous; stem round, 1 to 2 feet high; upper leaves flat; panicle unilateral, spreading; florets longer than their awns. *Hard Fescue-grass*.

Hab. Common in waste grounds, in pastures and dry meadows, where it yields a good and early crop, acceptable to all kinds of cattle. June, July. ♀

4. *F. rubra*, root extensively creeping; leaves downy on the upper side, more or less involute; panicle unilateral, spreading (compact when in flower); florets longer than their awns. (Whole plant glaucous green, and more or less tinged with brown.)

Hab. On the coasts of Holy Island, Winch. Spittal Sands, Thomp. July. ♀

5. *F. bromoides*, panicle nearly erect, racemose; florets tapering, shorter than their awns, rough at the top; leaves tapering, shorter than their sheaths; upper half of the stem naked, 4 to 8 inches high. *Barren Fescue-grass*.

Hab. Walls and dry pastures, not uncommon. On the dike near Ramsay's barn; about Ord Moor, and in many other similar places. June. ☉

6. *F. loliacea*, spike 2-ranked, drooping; spikelets nearly sessile, linear-oblong; florets cylindrical, awnless, pointed, with five slight ribs at the top; stem 2 feet high. *Spiked Fescue-grass*.

Hab. Moist meadows, rare. Side of the Tweed a little above Yarrowhaugh. June, July. ♀

Bears a great resemblance to the Rye-grass; but it has excellencies, says Mr SINCLAIR, which make it greatly superior to that grass for the purposes of either hay or permanent pasture. It seems to improve in produce in pro-

portion to its age, which is directly the reverse of the Rye-grass.

7. *F. pratensis*, panicle nearly upright, branched, spreading, turned to one side; spikelets linear, compressed; florets numerous, cylindrical, obscurely ribbed; nectary 4-cleft; root fibrous; stem 2 feet high; leaves linear. *Meadow Fescue-grass*.

Hab. Meadows and pastures. June, July. ♀

Mr CURTIS recommends this as in many respects superior to Rye-grass, at least for the purpose of forming or improving meadows. It is larger and more productive of foliage; it is strictly perennial, is very hardy, and will thrive not only in very wet, but also in dry ground. Its seeds are very abundant, easily gathered, and grow readily.

8. *F. elatior*, panicle somewhat drooping, much branched, spreading loosely every way; spikelets ovate-lanceolate; florets numerous, cylindrical, somewhat awned, obscurely ribbed; nectary four-cleft; root creeping: stem about 4 feet high; leaves linear-lanceolate. *Tall Fescue-grass*.

Hab. Moist meadows, and the banks of rivers, not uncommon. Dodd's Well, and other places on our seabanks, Thomp. River side above Yarrowhaugh. July. ♀

9. *F. sylvatica*, spike simple, drooping; spikelets nearly cylindrical, turned to one side; awns longer than their glumes; leaves hairy; stems 2 feet high, slender; root fibrous. *Wood Fescue-grass*.

Hab. Woods and moist meadows, frequent. July, Aug. ♀

36. BROMUS.

1. *B. mollis*, panicle erect, rather close, compound; spikelets ovate, downy; florets imbricated, depressed, ribbed; awns as long as the glumes; leaves and sheaths very soft and downy; stems 1 to 2 feet high. *Soft Brome-grass*.

Hab. Fields and road-sides, common. June. ♂

2. *B. asper*, panicle drooping, branched; spikelets linear-oblong, compressed; florets about 8, rather distant, lanceolate, compressed, downy, longer than the straight awn; leaves uni-

form, broad, the lower ones hairy; stem 4 to 6 feet high. *Hairy Brome-grass.*

Hab. Moist woods. Wooded banks above the Union Bridge, plentiful. July, Aug.

3. *B. sterilis*, panicle drooping, mostly simple; spikelets linear lanceolate; florets about 7, lanceolate, compressed, 7-ribbed, furrowed, shorter than the straight awn; leaves downy, narrow; stem about 2 feet high. *Barren Brome-grass.*

Hab. In hedges and by road sides. June, July. ☉

37. AVENA.

1. *A. fatua*, panicle erect, compound; spikelets pendulous; florets about 3, shorter than the calyx, bristly at the base, with an oblique scar, all awned. *Wild Oat.*

Hab. Corn fields—

—“ A detested weed
That wildly grows in them, but yields a crop
As if it had been sow'd.”

June, July. ☉

The Wild Oat is seldom found but on clays and stiff gravels; on all loose soils, on dryish turnip land, on sandy soils, and on fen and marsh land it is seldom seen. It is very difficult to eradicate, since, in spring, it cannot be sufficiently distinguished from the plants of other corn, to be selected and weeded out; and it has ripened and scattered its seeds before the corn has arrived at maturity.—The twisted awn makes an excellent hygrometer.

2. *A. pubescens*, panicle erect, nearly simple; florets about 3, longer than the calyx; partial stalk-bearded; leaves flat, downy; stem 1½ or 2 feet high; root somewhat creeping. *Downy Oat-grass.*

Hab. Dry limestone pastures, not uncommon in this neighbourhood. Sea and river banks. June. 2/

3. *A. pratensis*, panicle erect, with very short simple branches; florets about 5, longer than the calyx; partial stalk all over hairy; leaves involute, finely serrated, naked, with smooth sheaths; stem 12 or 18 inches high. *Narrow-leaved Oat-grass.*

Hab. By pastures. Over the Burgesses' Cove: near Spital Gull-hole, Thomp. River banks. July. 2/

4. *A. flavescens*, panicle much branched, spreading, erect; florets about 3, longer than the very unequal calyx; leaves flat, a little downy; stem 1 foot high; root somewhat creeping. *Yellow Oat-grass*.

Hab. Meadows and pastures, common. July. ¼

The straw of this grass, according to Mr COBBETT, affords the finest plat of any for making bonnets. He has tried for this purpose the greater number of our common kinds, and besides this recommends the Sweet-scented Vernal-grass, the Rye-grass, and the Crested Dog's-tail-grass, as most worthy of attention.

38. ARUNDO.

1. *A. phragmites*, florets about 5, awnless, longer than the calyx; panicle loose. *Common Reed*.

Hab. Banks of rivers, and in ponds and ditches, frequent. July. ¼

The Reed is much used for fences and thatching, for which purpose it is superior to common straw; and in several of the fenny counties in England, not only cottages, but houses of a better description, are covered with it. In most parts of the kingdom it is annually cut; and in the fenny parts of Lincolnshire forms a valuable harvest. PENNANT says, he saw a stock of reeds, the property of a single farmer, which was worth L. 200 or L. 300. In Holland, the panicles of flowers are extensively used for making hearth-besoms; and in Lapland, for dyeing coarse cloths of a yellowish green colour. The internal membrane of the stem, according to Mr ADIE, makes a hygrometer exceeding, in point of sensibility, every other substance that he has met with.

2. *A. arenaria*, calyx single flowered, longer than the corolla; panicle spiked; flowers erect, slightly awned; leaves involute, sharp-pointed. *Sea-Reed*, or *Bent*.

Hab. Sandy sea-coast from Spittal southward. July. ¼

This is one of the most valuable grasses for binding the sand of the sea-shore, and raising those banks which, in Norfolk, on our own coast, and especially in Holland, are the chief defence of the country against the encroachments of the ocean. For some interesting illustrations of its utility in this respect, the reader is referred to CUVIER's Essay on the Theory of the Earth. At Aberdeen and at

Anglesey it is manufactured into door-mats. It also makes excellent floor-brushes. In the Outer Hebrides it serves many purposes in rural and domestic economy, being made into ropes for various uses, mats for pack-saddles, bags, mats, and vessels for preparing and keeping grain and meal; and, lastly, into hats.—*Edin. Phil. Journ.* vi. 135.

39. LOLIUM.

1. *L. perenne*, corolla very slightly awned; spikelets longer than the calyx; florets lanceolate. (Smooth; stem 1 foot high, bent at the base.) *Rye-grass*.

Hab. Meadows and pastures. June. ♀

Generally sown with clovers, and the chief grass which enters into the composition of hay. It is not very lasting, except on a rich soil; and many intelligent cultivators consider it a very severe crop, and allege that wheat does not succeed well after the herbage with which it is intermixed in any considerable quantity.

2. *L. temulentum*, awns longer than the corolla; spikelets shorter than the calyx; florets elliptical; stem rough in the upper part, 2 feet high, erect. *Bearded Darnel*.

Hab. Corn fields, very rare. Near Shoreswood Hall, Dr Thompson. July. ☉

The seeds of this species possess deleterious properties when mixed with bread, corn or malt; and malignant epidemic fevers have been attributed to their operation. In this country it is so rare that it can seldom be productive of any mischief, but it is asserted to have been cultivated in the vicinity of London for the use of the brewer, who communicates to the beer an intoxicating quality by its means. It is the "infelix lolium" of VIRGIL:

—"interque nitentia culta

Infelix lolium et steriles dominantur avenæ.

3. *L. arvense*, corolla slightly awned; spikelets as long as the calyx; florets elliptical; stem very smooth. *Short-awned Darnel*.

Hab. Corn fields at Easington, rare. July. ☉

40. HORDEUM.

1. *H. murinum*, lateral flowers barren; calyx valves of the intermediate one lanceolate, fringed; stem a foot high, decumbent at the base. *Wall Barley*.

Hab. Road sides and waste grounds. July. ☉

2. *H. pratense*, lateral flowers imperfect, with shorter awns; all the calyx valves bristle-shaped and rough; stem $1\frac{1}{2}$ or 2 feet high, erect, slender. *Meadow Barley*.

Hab. Moist pastures, rare. Yarrow-haugh; and side of the river below the mouth of the Whiteadder, Dr Thompson. July. ♀

Mr THOMPSON seems to have found *H. maritimum* on Holy Island opposite St Cuthbert's; but our specimens from that station belong to *H. murinum*.

41. TRITICUM.

1. *T. junceum*, calyx-valves blunt, many-ribbed; florets about 5, awnless; main stalk smooth; leaves involute, sharp-pointed; stem 12 or 18 inches high, tinged with violet below; root creeping. Whole plant glaucous, rigid, smooth. *Sea Wheat-grass*.

Hab. Sandy sea-coast from Spittal southward, not very common. Holy Island. July. ♀

2. *T. repens*, calyx valves pointed or awned, lanceolate, many-ribbed; flowers about 5, sharp-pointed or awned; leaves flat; root creeping; stem 2 feet high. *Couch-grass*.

Hab. Cultivated fields. July. ♀

The *Quicken* of the farmer, and too well known as the most troublesome weed that infests his fields. At Naples, and in some parts of France, the roots are collected for feeding horses. "Upon the banks of the Garonne I met women," says Mr A. YOUNG, "loaded with the roots of this plant, going to sell it at market; and they informed me it was bought to feed horses with."—"As," says Mr GRAY, "it is very saccharine, and may be had at the cheapest rate, if not for nothing, it is recommended to be brewed for a table-beer."

3. *T. caninum*, calyx-valves somewhat awned, with 3 or 5 ribs; florets 4, awned; leaves flat; root fibrous. *Fibrous-rooted Wheat-grass*.

Hab. "Ashwood, Belford," Thomp. July. 2/

III. TRIGYNIA.

42. MONTIA.

1. *M. fontana*, herb smooth, succulent; leaves opposite, small, spathulate; flowers small, white, on curved stalks. *Water Blinks*.

Hab. By springs and streams, particularly on heathy ground, frequent; very luxuriant and plentiful on Cheviot, not far from the summit. June, July. ☉

In general, this plant is low, diffused, and much branched; sometimes, however, the stems rise to a height of 6 inches, and are only distantly branched, while a few radicle fibres spring from beneath each joint.

CLASS IV.

TETRANDRIA.

“ Can it be believed, that Nature bestowed beauty on the foliage of a flower but with a view to please? The fruit might be produced, in the same process, without any richness and diversity of colour. No other animals are sensible of their grace but the human; and yet the austere man of business, or the vain man of pleasure, will arraign another with a face of importance for his admiration of a flower. He calls the taste trifling and useless. But is not a refusal to be pleased with such appearances, like the malignant unthankfulness of a sullen guest, who refuses to taste the most delicious dainties prepared for his entertainment?”—Dr V. KNOX.

I. MONOGYNIA.

* *Flowers monopetalous, superior, single-seeded.*

43. DIPSACUS. *Common calyx* of many leaves; *proper calyx* single, superior, of 1 leaf, cup-shaped, crowning the *seed*. (Flowers capitate.)

44. SCABIOSA. *Common calyx* of many leaves; *proper calyx* double, superior, crowning the *seed*. (Flowers capitate.)

* * *Flowers monopetalous, superior, 2-seeded.*

47. GALIUM. *Corolla* flat; *fruit* dry. (Flowers corymbose or panicled, lateral or terminal.)

46. ASPERULA. *Corolla* tubular; *fruit* without a crown. (Flowers terminal, panicled.)

45. *SHERARDIA*. *Corolla* tubular; *fruit* crowned with the *calyx*, each *seed* with 3 teeth. (Flowers umbellate.)

* * * *Flowers monopetalous, inferior.*

48. *PLANTAGO*. *Corolla* reflexed; *stamens* very long; *capsule* bursting all round, of 2 or 4 cells. (Flowers in simple dense spikes.)

* * * * *Petals 4.*

49. *CORNUS*. *Nectary* 0; *drupa* inferior; *nut* of 2 cells. (Flowers cymose or umbellate.)

* * * * * *Petals wanting.*

50. *PARIETARIA*. *Calyx* 4-cleft, inferior; *stamens* elastic; *seed* invested with the elongated *calyx*; some flowers without *stamens*, their *calyx* remaining unaltered.

51. *ALCHEMILLA*. *Calyx* 8-cleft, inferior; *seed* 1 or 2, naked.

II. TETRAGYNIA.

52. *ILEX*. *Corolla* wheel-shaped, of 1 or 4 petals; *berry* with 4 seeds; *styles* 0; some flowers barren.

54. *SAGINA*. *Petals* 4; *capsule* of 1 cell and 4 valves: *calyx* 4-leaved.

55. *RADIOLA*. *Petals* 4; *capsule* of 8 cells and 8 valves; *calyx* of 1 leaf, in 12 segments.

53. *POTAMOGETON*. *Petals* 4; *calyx* 0; *seeds* 4, naked, sessile. (Aquatic. Flowers spiked, greenish, raised above the water.)

I. MONOGYNIA.

43. DIPSACUS.

1. *D. sylvestris*, leaves opposite, serrated; scales of the receptacle straight; common calyx inflexed, longer than the head.
Wild Teasel.

Hab. Road sides very rare. Near Shoreswood, Dr Thompson. July. ♂

44. SCABIOSA.

1. *S. succisa*, corolla in 4 equal segments; heads of dark purplish blue flowers nearly globular; stem-leaves distantly toothed.
Devil's-bit Scabious.

Hab. Moist meadows and pastures, common. August—October. ♀

At one time the root (which is as it were bitten off) is supposed to have possessed an almost specific virtue against every kind of scaly eruptions, whence the generic name; but as “the superstitious people hold opinion,” afraid of being deprived by its means of this method of tormenting poor mortal man, “the divel did bite it for envie, because it is an herbe that hath so many good vertues, and is so beneficial to mankinde.” And in very verity the malice of the devil, as SMITH observes, “has unhappily been so successful, that no virtues can now be found in the remainder of the root or herb.”

2. *S. arvensis*, corolla in 4 segments, the marginal flowers radiant; heads large, convex, pale purple; leaves pinnatifid, cut; stem bristly. *Field Scabious.*

Hab. Corn fields and pastures, common. July. ♀

3. *S. columbaria*, corolla in 5 unequal segments; flowers pale purple; radical leaves ovate or lyrate, notched, the rest pinnatifid with linear segments. *Small Scabious.*

Hab. Dry pastures, frequent in this neighbourhood. Banks of the Tweed below West Ordhouse, Dr Thompson. Castle hills. Sides of the ravine above Newfarm. Spindlestone Hills. July, August. ♀

45. SHERARDIA.

1. *S. arvensis*, stems spreading, branched; leaves 6 in a whorl; flowers terminal, pale blue. *Blue Sherardia*.

Hab. Dry corn fields and waste places, common. ☉

46. ASPERULA.

1. *A. odorata*, stems erect, simple; leaves 8 in a whorl, lanceolate; panicles stalked, of few white flowers. *Sweet Woodruff*.

Hab. Woods and shady places. Ashwood, Belford, Thomp. Fenwick Wood, and hedge sides between it and Detchint. June. 2/

47. GALIUM.

* *Fruit smooth; flowers yellow.*

1. *G. verum*, leaves 8 in a whorl, linear, channelled, entire, rough; flowers in dense panicles. *Yellow Bed-straw*.

Hab. Dry banks, and edges of corn fields. July, Aug. 2/

GERARDE tells us that "the people in Cheshire, especially about Namptwich, where the best cheese is made, do vse it in their rennet, esteeming greatly of that cheese aboue other made without it." The Highlanders also use a strong decoction of the herb as a rennet to curdle milk; and of the roots to dye red, boiling them with the yarn, and adding alum to fix the colour, which, according to Mr CURTIS, is superior to that of madder. The whole plant dies a good yellow.

2. *G. cruciatum*, leaves ovate, hairy, 4 in a whorl; stem hairy, simple above; flowers polygamous, clustered, lateral, with 2 leaves on their stalks. *Crosswort*.

Hab. Thickets and hedges, common. May, June. 2/

** *Fruit smooth; flowers white.*

3. *G. palustre*, leaves obovate, obtuse, the upper ones 4 in a whorl, unequal in size; stem weak, branched in the upper part, branches patent. *Water Bed-straw*.

Hab. Boggy places and ditches. July. 2/

SMITH says the stems are smooth, but we have never seen them otherwise than rough with deflexed prickles.

4. *G. Witheringii*, leaves about 5 in a whorl, widely spreading, lanceolate, fringed with bristles; stem upright, slightly branched, rough with reversed hooks.

Hab. In moist spots in the vale below Langley-Ford, plentiful. July. ♀

There are only 4 nearly equal leaves on the branches, rough on the keel and margins, with reverted prickles, and gangrened at the apex, which is not pointed either with a bristle or hair. Flower-buds pink.—Our specimens were verified by Mr WINCH, and they appear to me more nearly allied to *G. uliginosum* than to the *palustre*, yet distinct from both.

5. *G. uliginosum*, leaves 6 in a whorl, obovate-lanceolate, rigid, bristle-pointed, their edges rough, like the stem, with recurved prickles; fruit smooth, smaller than the corolla. *Marsh Bed-straw.*

Hab. Watery places, not uncommon. Castle-hills. Boggy field west of the Steps-of-Grace Farm-house, Thomp. Aug. ♀

6. *G. saxatile*, leaves 6 in a whorl, obovate, obtuse with a small point; stem much branched, prostrate, smooth; fruit granulated. *Heath Bed-straw.*

Hab. Dry heaths and hilly ground, common. June-Aug. ♀

* * * *Fruit bristly.*

7. *G. Aparine*, leaves 6 or 8 in a whorl, lanceolate, keeled, rough, fringed with reflexed prickles; stem weak; fruit a double globe. *Goose-grass*, or *Robin-run-the-Hedge*, a name very expressive of its habits, and by which it is best known in this neighbourhood.

Hab. Hedges very common. July, Aug. ☉

“The roasted seeds are said to be no bad substitute for coffee, to which they are botanically related; and, if raised for a crop, they might, perhaps, have the additional recommendation, to some people, of being very much dearer.”—SM.

48. PLANTAGO.

1. *P. major*, leaves ovate, smoothish, somewhat toothed, on longish footstalks; flower-stalks round; spike tapering, long; seeds numerous. *Greater Plantain.*

Hab. Meadows, pastures, and road-sides. June, July. ½

The seeds are eaten by small birds, and are frequently given to those kept in cages. An important plant in the pharmacopœia of the village doctress,

“ ————— well skill'd
In every virtuous plant, and healing herb,
That spreads her verdant leaf to the morning ray.”

3. *P. media*, leaves ovate, downy, with very short footstalks; flowerstalks round; spike cylindrical, thick, and rather short; seeds solitary. *Hoary Plantain*.

Hab. Dry pastures common. June–Aug. ½

3. *P. lanceolata*, leaves lanceolate, entire, tapering at each end, woolly at the base; flower-stalks angular; spike ovate. *Ribwort Plantain*.

Hab. Meadows and pastures. June, July. ½

The “Wabret-leaf” of Teviotdale. See LEYDEN’s *Scenes of Infancy*. The Rib-grass of the farmer, and cultivated to a considerable extent on light moorish land. We have a specimen in which the stalk bears several spikes, some sessile, others pendent on partial stalks, and the whole intermixed with leaves disposed in a rose-like manner; and my friend Dr THOMPSON found in Haiden Dean the rarer monstrosity of several perfect heads on the summit of one stalk.

4. *P. maritima*, leaves linear, channelled, nearly entire; flower-stalks round, longer than the leaves; spike cylindrical. *Sea Plantain*.

Hab. Sea and river banks. Lamberton Moor. Aug. ½

5. *P. coronopus*, leaves in many pinnate linear segments; flower-stalks round. *Buck’s-horn Plantain*.

Hab. Sea and river banks, common. June–Aug. ☉

The spikes of this and the preceding droop before the flowers are evolved, when they become erect. The variety β of the English Flora, with leaves scarcely divided, and a small round head, may be found about the Needle-Eye, and on the Farn Isles.

49. CORNUS.

1. *C. suecica*, stem herbaceous, 4 to 6 inches high; leaves opposite, ovate, smooth, ribbed; flowers few, umbellate, surrounded by a 4-leaved involucre, and springing from the axil of the forked extremity of the stem. *Dwarf Cornel.*

Hab. "In Northumbriæ montibus Chevioticis dictis, in latere occidentali septentrionalis partis montis altissimi copiosissime," RAY. It remained unobserved in this station, until I rediscovered it in the summer of 1828. It grows close to the spring, where those ascending generally rest themselves; and though limited to a small space, is still abundant. July, Aug. 7

50. PARIETARIA.

1. *P. officinalis*, stem ascending, reddish; leaves lanceolate, ovate, without lateral ribs at the base; involucre 3-flowered, with 7 ovate segments. *Pellitory-of-the-Wall.*

Hab. Old walls. Ramparts. Old Castle, Thomp. Dike below the Chain Bridge. June. 7

51. ALCHEMILLA.

1. *A. vulgaris*, leaves lobed, plaited, uniform, serrated, flowers yellowish-green, in terminal corymbose clusters. *Common Lady's-mantle.*

Hab. Pastures and road-sides common. Near the top of Cheviot with little variation in character. June, July. 7

2. *A. arvensis*, leaves flat, 3-lobed, cut, pubescent; flowers green, sessile, axillary. *Field Lady's-mantle.*

Hab. Sandy or gravelly fields, and on dikes capped with earth, common. May, &c. 7

II. TETRAGYNIA.

52. ILEX.

1. *I. Aquifolium*, leaves ovate, acute, spinous and wavy; flowers axillary, somewhat cymose. *Common Holly.*

Hab. Hedges and woods; apparently quite wild on the basaltic rocks above Kyloe. June.

The holly, when full grown, is one of the most ornamental trees, and late in autumn or in winter, when its scarlet berries contrast well with the lively evergreen foliage, it never fails to attract attention and to please. It makes good hedges. "Is there," says EVELYN, "under heaven a more glorious and refreshing object of the kind, than an impregnable hedge of about 400 feet in length, 9 feet high, and 5 in diameter, which I can now shew in my now ruined gardens at Say's Court, at any time of the year, glittering with its armed and varnished leaves; the taller standards, orderly distances, blushing with their natural coral." The lower leaves are very spinous, while the upper ones are entire, a fact which has not escaped the notice of our poet SOUTHEY:

"O Reader! hast thou ever stood to see
 The Holly Tree?
 The eye that contemplates it well perceives
 Its glossy leaves,
 Order'd by an Intelligence so wise,
 As might confound the Atheist's sophistries.
 Below, a circling fence, its leaves are seen
 Wrinkled and keen;
 No grazing cattle through their prickly round
 Can reach to wound;
 But as they grow where nothing is to fear,
 Smooth and unarm'd the pointless leaves appear.
 I love to view these things with curious eyes,
 And moralize:
 And in this wisdom of the Holly tree
 Can emblems see,
 Wherewith perchance to make a pleasant rhyme,
 One which may profit in the after-time.
 Thus, though abroad perchance I might appear
 Harsh and austere,
 To those who on my leisure would intrude
 Reserved and rude,
 Gentle at home amid my friends I'd be
 Like the high leaves upon the Holly tree."

Bird-lime is made from the mucilaginous bark; and the wood, white, hard, and close-grained, is used in inlaying and veneering, and by turners. Houses and churches are adorned at Christmas with the leaves and berries, a relic probably of Druidism, during the prevalence of which,

according to Dr CHANDLER, "houses were decked with them, that the sylvan spirits might repair to them unnipped by frost and cold winds, until a milder season had renewed the foliage of their darling abodes."

53. POTAMOGETON.

1. *P. natans*, upper leaves oblong-ovate, stalked, floating, coriaceous; lower ones linear, membranous, sessile. *Broad-leaved Pond-weed.*

Hab. Ponds and rivulets, common. July. 74

2. *P. perfoliatum*, leaves heart-shaped, clasping the stem, uniform, all submersed. *Perfoliate Pond-weed.*

Hab. In the Tweed and Whiteadder, and in large ponds, common. July. 74

3. *P. heterophyllum*, upper leaves elliptical, stalked, floating, slightly coriaceous; lower ones lanceolate, membranous, sessile; flower-stalks swelling upward. *Various-leaved Pond-weed.*

Hab. Coldingham Lough. July–Sept. 74

Our specimens were imperfect, but the species was determined by Mr WINCH. The stems are long, slender, round, sparingly and distantly branched. Lower leaves alternate, distant, pointed, with spinous serrated edges. They are beautifully ribbed, the ribs being connected by regular parallel side-branches.

4. *P. lucens*, leaves elliptic-lanceolate, very large, pointed, membranous, stalked, repeatedly triple-ribbed, all submersed; spike dense, many-flowered. *Shining Pond-weed.*

Hab. In the Tweed, above the Union Bridge, plentiful. June, July. 74

5. *P. crispum*, leaves lanceolate, waved, serrated, alternate, the upper ones opposite; flowers in loose spikes. *Curled Pond-weed.*

Hab. Ponds, common. July. 74

6. *P. pusillum*, leaves linear, pointed, opposite or alternate, 3-ribbed; stem compressed on one side; flower-stalks axillary, mostly lateral, many times longer than their spikes. *Small Pond-weed.*

Hab. Ponds and slow streams, frequent. In the Tweed and Whiteadder. Loch in Holy Island, and at Coldingham. July. 74

Stems a foot long, slender, wavy, smooth, striated, compressed on one side, more rounded on the other. Leaves alternate or opposite, $1\frac{1}{2}$ inch long, about 1-16th of an inch broad, grass-like, pointed, often dilated at the base, with slightly revolute margins. Each leaf has 3 ribs, the lateral half-way between the mid-rib and margin, distinct and joining the mid-rib at some distance below the point, and rarely opposite to one another. Stipulas long, membranous, linear, pointed, many-nerved, beautifully cellular. Flower-stalks terminal and lateral, from between 2 broader and shorter stipulas, much longer than the loose spike. Flowers brown, few. Seeds large, oblique, beaked. Influenced by the character of the stem (always evidently compressed), I at first considered our plant the *P. compressum* of SMITH; but the specimens submitted to Mr WINCH were referred by him to *P. pusillum*, and in this opinion I concur, after a re-examination of the subject. There is indeed some discrepancy in our descriptions, which I do not pretend to reconcile. The fig. of Petiver, *Hort. Brit.* t. 5. f. 11, quoted by SMITH, is a good representation of our species; while fig. 10, usually considered as representative of *P. compressum*, is not so, being much too large. I have had no opportunity of consulting his other references. It is singular that so common a plant should not have occurred either to Dr GREVILLE (see *Fl. Edin.*), or HOOKER (*Fl. Scot.*) May it not be the *P. compressum* of the latter very eminent botanist?

7. *P. pectinatum*, leaves bristle-shaped, single-ribbed, parallel, thickly set in two ranks, sheathing at the base; spikes interrupted. *Fennel-leaved Pond-weed.*

Hab. Plentiful in the Tweed and Whiteadder. Holy Island Loch. Coldingham Loch. July. ¼

54. SAGINA.

1. *S. procumbens*, stems procumbent, smooth; leaves minutely pointed; petals half as long as the calyx. *Procumbent Pearl-wort.*

Hab. Sandy and gravelly soils, and sides of shady walls, very common. May-Aug. ¼

2. *S. maritima*, stems nearly upright, divaricated, smooth; leaves obtuse, without bristles; petals none. *Sea Pearl-wort.*

Hab. By the side of the canal below New-water Haugh. On rocks in Holy Island, between the Heugh and the Castle. June, July. ☉

3. *S. apetala*, stems nearly upright, hairy; leaves bristle-pointed, fringed; petals very small, or wanting. *Annual Pearlwort.*

Hab. Dry barren places, rare. On the parapet of the Walls at Fisher's Fort, plentiful. May, June.

55. RADIOLA.

1. *R. millegrana*, 1-2 inches high, repeatedly dichotomous, bushy; leaves sessile, opposite, ovate, smooth; flowers axillary, solitary, stalked, numerous, white. *All-seed.*

Hab. Wet sandy ground rare. Ancroft Moor. July, Aug. ☉

CLASS V.
PENTANDRIA.

———" In the train of Spring, arrive
Sweet flowers ;—what living eye hath viewed
Their myriads ?—endlessly renewed,
Wherever strikes the sun's glad ray ;
Where'er the joyous waters stray ;
Wherever sportive zephyrs bend
Their course, or genial showers descend !"

WORDSWORTH.

I. MONOGYNIA.

* *Flowers monopetalous, inferior, with 2 or 4 naked seeds. Asperifoliae.*

64. ECHIUM. Throat of the *corolla* dilated, naked ; *limb* irregular ; *stigma* deeply cloven.
57. LITHOSPERMUM. *Corolla* naked in the throat, funnel-shaped ; *calyx* in 5 deep segments.
60. SYMPHYTUM. *Corolla* closed with awl-shaped converging valves ; *limb* bell-shaped.
61. BORAGO. *Corolla* closed with awl-shaped or notched valves ; *limb* wheel-shaped.
63. LYCOPSIS. *Corolla* closed with concave obtuse valves, funnel-shaped, with a doubly bent tube ; *seeds* concave at the base.

58. *ANCHUSA*. *Corolla* closed with concave obtuse valves, funnel-shaped; *tube* straight, tumid below; *seeds* concave at the base.
62. *ASPERUGO*. *Corolla* closed with concave obtuse valves, salver-shaped; *calyx* of the fruit compressed, with jagged parallel lobes.
56. *MYOSOTIS*. *Corolla* half closed with rounded valves, salver-shaped, lobes obtuse; *seeds* perforated at the base, borne by the calyx.
59. *CYNOGLOSSUM*. *Corolla* half closed with rounded valves, funnel-shaped; *seeds* depressed, imperforate, borne by a central column.
- * * *Flowers monopetalous, inferior, with numerous covered seeds.*
68. *ANAGALLIS*. *Capsule* of 1 cell bursting all round; *corolla* wheel-shaped; *stamens* hairy.
67. *LYSIMACHIA*. *Capsule* of 1 cell with 10 valves; *corolla* wheel-shaped.
65. *PRIMULA*. *Capsule* of 1 cell opening with 10 teeth; *corolla* salver-shaped, tube cylindrical, throat open; *stigma* globular.
66. *MENYANTHES*. *Capsule* of 1 cell; *corolla* hairy; *stigma* divided.
76. *ERYTHRÆA*. *Capsule* of 2 incomplete cells; *corolla* salver-shaped; *anthers* finally spiral.
73. *HYOSCYAMUS*. *Capsule* of 2 cells with a lid; *corolla* funnel-shaped; *stigma* capitate.
72. *VERBASCUM*. *Capsule* of 2 cells; *corolla* wheel-shaped, irregular; *stigma* obtuse; *stamens* declining.
69. *CONVOLVULUS*. *Capsule* of 2 or 3 cells, with 2 seeds in each; *corolla* bell-shaped, plaited; *stigmas* 2.
75. *SOLANUM*. *Berry* of 2 cells; *corolla* wheel-shaped; *anthers* with 2 pores.

74. *ATROPA*. Berry of 2 cells; corolla bell-shaped; stamens distant, incurved; anthers heart-shaped.

* * * *Flowers monopetalous, superior.*

77. *SAMOLUS*. Capsule of 1 cell with 5 recurved valves; corolla funnel-shaped, 5-cleft, with intermediate scales.

70. *CAMPANULA*. Capsule of 2 or 3 cells, with torn fissures at the base; corolla bell-shaped; stigma 2 or 3 cleft, revolute.

78. *LONICERA*. Berry of 1 or more cells, with many seeds; corolla irregular.

* * * * *Flowers of 5 or 4 petals, inferior.*

79. *EUONYMUS*. Capsule of 4 or 5 cells; seeds with a fleshy tunic; calyx flat.

71. *VIOLA*. Capsule of 1 cell and 3 valves; calyx of 5 leaves extended at the base; corolla irregular, spurred.

* * * * * *Flowers of 5 petals, superior.*

80. *RIBES*. Berry with many seeds; calyx bearing the petals; style divided.

81. *HEDERA*. Berry with 3-5 seeds; calyx surrounding the germen; style simple; petals broadish at the base.

* * * * * *Petals wanting.*

82. *GLAUX*. Capsule superior with 5 seeds; calyx coloured, of 1 leaf.

II. DIGYNIA.

* *Flowers monopetalous, inferior.*

86. *GENTIANA*. Capsule of 1 cell; corolla tubular at the base, destitute of nectariferous pores.

* * *Petals wanting ; seed solitary.*

83. CHENOPODIUM. *Seed* lenticular, tunicated, superior.
84. SALSOLA. *Capsule* closed, imbedded in the fleshy *calyx* ; *seed* with a spiral *embryo*.
85. ULMUS. *Capsule* closed, membranous, compressed, bordered, superior.

* * * *Flowers of 5 petals, superior ; seeds 2.*

(UMBELLIFEROUS PLANTS.)

A. *Fruit beaked.*

91. SCANDIX. *Beak* much longer than the seeds ; *fruit* somewhat bristly ; *calyx* none ; *petals* unequal, undivided : *floral receptacle* 5-lobed, coloured.
90. ANTHRISCUS. *Beak* shorter than the seeds, even ; *fruit* rough, with scattered prominent bristles ; *calyx* none ; *petals* equal, inversely heart-shaped ; *fl. recept.* slightly bordered.
92. CHÆROPHYLLUM. *Beak* shorter than the seeds, angular : *fruit* smooth, without ribs ; *calyx* none ; *petals* inversely heart-shaped, rather unequal ; *fl. recept.* wavy.

B. *Fruit solid, prickly, without a beak.*

87. SANICULA. *Fruit* ovate, clothed with hooked bristles ; *calyx* acute ; *petals* lanceolate, inflexed, nearly equal ; *flowers* separated, dissimilar.
88. DAUCUS. *Fruit* elliptic-oblong, compressed transversely ; *seeds* with 4 rows of flat prickles, and rough intermediate ribs ; *calyx* obsolete ; *petals* inversely heart-shaped, unequal ; *flowers* separated.
89. TORILIS. *Fruit* ovate, slightly compressed laterally ; *seeds* ribless, rough, with scattered prominent ascending rigid

prickles; *calyx* short, broad, acute, nearly equal; *petals* inversely heart-shaped, nearly equal; *flowers* united.

C. Fruit solid, nearly round, unarmed, without wings.

93. MYRRHIS. *Fruit* deeply furrowed; *calyx* none; *petals* inversely heart-shaped, rather unequal; *fl. recept.* none; *flowers* imperfectly separated.

94. BUNIUM. *Fruit* slightly ribbed; *calyx* small, acute, unequal; *petals* inversely heart-shaped, equal; *fl. recept.* none; *flowers* imperfectly separated.

98. CENANTHE. *Fruit* ribbed, somewhat spongy; *calyx* large, lanceolate, acute, spreading, unequal; *petals* inversely heart-shaped, radiant, very unequal; *fl. recept.* dilated, depressed; *flowers* separated.

103. PIMPINELLA. *Fruit* ovate, ribbed, with convex interstices; *styles* capillary, as long as the fruit; *calyx* none; *petals* inversely heart-shaped, nearly equal; *fl. recept.* none; *flowers* either united or dioecious.

D. Fruit solid, unarmed, without wings, compressed laterally, its transverse diameter being at least twice the breadth of the juncture.

95. SIUM. *Fruit* ovate or orbicular, ribbed, furrowed; *calyx* small, acute, unequal or obsolete; *petals* inversely heart-shaped or obovate, equal; *styles* cylindrical, shorter than the petals; *fl. recept.* none; *flowers* uniform, united.

97. CONIUM. *Fruit* ovate, with 10 acute ribs, wavy in an unripe state; *calyx* obsolete; *petals* inversely heart-shaped, slightly unequal; *styles* a little tumid at the base; *fl. recept.* dilated, depressed, wavy, permanent; *flowers* slightly irregular, united.

99. SMYRNIUM. *Fruit* broader than long, concave at each side, with 6 acute dorsal ribs, interstices convex; *calyx* very small, acute; *petals* equal, lanceolate, incurved, or in-

versely heart-shaped; *styles* tumid and depressed at the base; *fl. recept.* none; *flowers* nearly regular, partly barren or abortive.

100. **ÆGOPodium.** *Fruit* elliptic-oblong, with equidistant ribs, interstices flattish; *calyx* none; *petals* inversely heart-shaped, broad, a little unequal; *styles* ovate at the base; *fl. recept.* none; *flowers* united, all perfect, slightly radiant.
104. **Cnidium.** *Fruit* ovate, acute, with equidistant very sharp ribs, interstices deep, concave, juncture contracted; *calyx* none; *petals* equal, obovate or inversely heart-shaped; *styles* hemispherical at the base, subsequently elongated, spreading, cylindrical; *fl. recept.* annular, thin, undulated, erect, afterwards depressed; *flowers* imperfectly separated, nearly regular.
105. **Hydrocotyle.** *Fruit* nearly orbicular, rather broader than long, angular, much compressed, juncture very narrow; *calyx* none; *petals* equal, ovate, spreading, undivided; *styles* cylindrical, shorter than the stamens, tumid at the base; *fl. recept.* none; *flowers* all perfect and regular.
- E. *Fruit solid, unarmed, compressed transversely, the juncture being broader than the transverse diameter.*
96. **Æthusa.** *Seeds* ovate, convex, with 5 tumid rounded acutely keeled ribs, interstices deep, acute-angular, border none; *calyx* pointed, very minute; *petals* inversely heart-shaped, rather irregular; *fl. recept.* none; *flowers* all perfect, slightly radiant.
101. **Angelica.** *Seeds* elliptic-oblong, convex, with 3 dorsal wings, and a narrow flat even border; *calyx* none; *petals* lanceolate, flattish, undivided, contracted at each end, equal; *fl. recept.* thin, wavy, narrow, permanent; *flowers* all perfect, regular.
102. **Ligusticum.** *Seeds* oblong, convex, with 3 dorsal and 2 marginal equal wings; *calyx* small, pointed, erect, broad at the base; *petals* elliptical, flattish, undivided, contracted at each end, equal; *fl. recept.* none; *flowers* all perfect, regular.

F. *Fruit thin and almost flat, compressed transversely, without dorsal wings.*

106. **HERACLEUM.** *Seeds* inversely heart-shaped, with a notch at the summit, very nearly flat, with 3 slender dorsal ribs, 2 distant marginal ones, and 4 intermediate coloured depressed abrupt lines from the top; border narrow, slightly tumid, smooth, even and entire; *calyx* of 5 small acute evanescent teeth; *petals* inversely heart-shaped, radiant; *fl. recept.* wavy, crenate, obtuse; *flowers* separated.

III. TRIGYNIA.

* *Flower superior.*

107. **VIBURNUM.** *Corolla* 5-cleft; *berry* with 1 seed.
 108. **SAMBUCUS.** *Corolla* 5-cleft; *berry* with 3 seeds.

IV. TETRAGYNIA.

109. **PARNASSIA.** *Nectaries* fringed with bristles bearing globes; *capsule* of 4 valves.

V. PENTAGYNIA.

111. **LINUM.** *Petals* 5; *capsule* of 10 cells.
 110. **STATICE.** *Petals* 5; *seed* 1, clothed with the base of the funnel-shaped calyx.

VI. HEXAGYNIA.

112. **DROSERA.** *Petals* 5; *capsule* of 3 valves with many seeds.

I. MONOGYNIA.

56. MYOSOTIS.

* *Roots perennial, or perhaps biennial.*

1. *M. palustris*, root creeping; leaves oblong-lanceolate, roughish, with close bristles; clusters leafless; flowers large, on divergent stalks twice as long as the 5-toothed patent calyx; limb of the corolla horizontal, longer than the tube; seeds smooth. *Forget-me-not.*

Hab. Sides of ponds and rivulets, frequent. June—Aug.

This very beautiful flower is considered as the emblem of friendship in almost every country in civilized Europe. The following tale of the origin of the name is given in MILL'S History of Chivalry, vol. i. p. 315, to whom it was communicated by Dr A. T. THOMSON. "Two lovers were loitering on the margin of a lake, on a fine summer's evening, when the maiden espied some of the flowers of *Myosotis* growing on the water, close to the bank of an island, at some distance from the shore. She expressed a desire to possess them, when the knight, in the true spirit of chivalry, plunged into the water, and swimming to the spot, cropped the wished-for plant, but his strength was unable to fulfil the object of his achievement, and feeling that he could not regain the shore, although very near it, he threw the flowers upon the bank, and casting a last affectionate look upon his lady-love, he cried, 'Forget-me-not,' and was buried in the waters."

2. *M. cæspitosa*, root fibrous, or slightly creeping; herb covered with closely appressed bristles; leaves oblong-lanceolate; clusters leafy at the base; flowers small; calyx funnel-shaped, with broad spreading teeth; limb of the corolla the length of the tube; seeds smooth.

Hab. Watery places not uncommon. In the lane below Unthank Colliery. June, July.

Our plant, Mr WINCH informs me, agrees with specimens from Mr FORSTER. It appears to be a good species. It is, as SMITH remarks, "of a weaker, paler, more lax habit than the foregoing, having always a leaf or two at the

base of each cluster." The flowers are not larger than those of *M. arvensis*; while the bristles on the calyx, and on the herb in general, are more widely set. The specific name is a bad one, and calculated to mislead—for, though the plant does often grow in a very crowded manner, it is certainly never cespitose or tufted. It is perhaps the *M. repens* of DON. See HOOKER, Fl. Scot. i. 67.

3. *M. sylvatica*, root fibrous; stems erect, hairy; leaves oblong-lanceolate, with soft hairs; clusters with a leaf at the base; flowers large; tube of the calyx clothed with hooked bristles, segments with straight upright hairs. *Wood Scorpion-grass*.

Hab. Woods. Horncliff-dean. June, July.

* * *Roots annual.*

4. *M. arvensis*, root fibrous; leaves oblong-lanceolate, hairy; flowers small, their stalks (in fruit) patent, twice the length of the closed hairy calyx, the hairs of the tube hooked; seeds smooth. *Field Scorpion-grass*.

Hab. Dry sandy fields, &c. common. June—Aug.

5. *M. versicolor*, root fibrous; leaves oblong-lanceolate, hairy; flowers very small, yellow and blue; their stalks erect-patent, shorter than the closed calyx, the hairs of the tube hooked; seeds smooth. *Yellow and Blue Scorpion-grass*.

Hab. Heaths, sandy fields, on earth-capt dikes, and sometimes in moist meadows. April—June.

57. LITHOSPERMUM.

1. *L. arvense*, stem erect, branched; leaves lanceolate, acute, hairy; corolla white, not much longer than the calyx; seeds wrinkled. *Corn Gromwell*.

Hab. Corn fields frequent. May, June. ☉

The *L. maritimum* grew, in the time of RAY, "at Scrammerston Mill, between the Salt-pans and Berwick on the sea-beach, about a mile and a half from Berwick," but, we believe, it will now be sought for in vain.

58. ANCHUSA.

1. *A. sempervirens*, leaves ovate, nearly entire, the lower ones upon long footstalks; flower-stalks axillary, each bearing two dense spikes, with an intermediate flower, and two principal ovate bracteas; flowers bright sky-blue. *Evergreen Alkanet.*

Hab. Waste ground, probably an outcast from the garden. In a hedge behind Ramsay's Barn, Dr Thompson. Bank in front of Netherbyres House, Mr Baird, Near the Grieve's House. June. ♀

59. CYNOGLOSSUM.

1. *C. officinale*, stem-leaves lanceolate, sessile, the radical ones stalked; herb downy; stamens shorter than the corolla; flowers without bracteas, dull crimson. *Common Hound's-tongue.*

Hab. Waste grounds. Wind-mill-hole, and Castle banks. Links from Scrammerston southward, Thomp. Holy Island. July. ♂

60. SYMPHYTUM.

1. *S. tuberosum*, stem simple; leaves ovate-oblong, slightly decurrent, rather harsh, upper ones opposite; flowers drooping, yellowish white. *Tuberous-rooted Comfrey.*

Hab. Side of the Whiteadder, half-way between its mouth and the bridge, rare. May, June. ♀

61. BORAGO.

1. *B. officinalis*, plant bristly; leaves alternate, the lower ones obovate, stalked, the upper sessile; segments of the large brilliant blue corolla ovate, acute, spreading. *Common Borage.*

Hab. Waste grounds. Fields at Halidown, Mr A. Baird. About Lamberton House. July. ♂

“Ego Borago gaudia semper ago.”—“Those of our time,” says GERARDE, “do vse the flowres in sallads, to exhilarate and make the mind glad. There be also many things made of them, vsed euery where for the comfort of the heart, for the driuing away of sorrow, and encreasing the ioy of the minde.” It undoubtedly answered these purposes best when put, as was customary, into wine.

62. ASPERUGO.

1. *A. procumbens*, stems prostrate, square, rough; leaves elliptic-lanceolate, rough; flowers small, blue, axillary, solitary, on short stalks; calyx when in fruit deflexed, much enlarged. *German Madwort.*

Hab. "In the Holy Island," Ray. "On Bamburgh-Castle, confined to a small spot," Miss Nivison. June, July. ☉

63. LYCOPSISIS.

1. *L. arvensis*, herb bristly; leaves lanceolate, wavy, somewhat toothed, very bristly; stalks of the bright blue flowers and fruit erect; limb of the corolla slightly unequal. *Small Bugloss.*

Hab. Corn fields frequent. June, July. ☉

64. ECHIUM.

1. *E. vulgare*, stem bristly and warty; stem-leaves lanceolate, bristly, single ribbed; spikes lateral, deflexed, hairy; flowers most beautiful, at first reddish purple, then brilliant blue. *Viper's Bugloss.*

Hab. Waste grounds, and occasionally in dry corn fields. Banks of the Whiteadder, from its mouth to Edrington; Holy Island Links; Wooler, Thomp. North side of the Tweed above the Union Bridge, &c. July. ♂

65. PRIMULA.

1. *P. vulgaris*, leaves obovate-oblong, toothed, wrinkled; stalks single-flowered; limb of the corolla flat. *Common Primrose.*

Hab. Grassy banks towards the sea, and in deans, common. April, May. ♀

We have gathered a variety with purplish flowers in Longridge Dean; and the variety with the flowers in an umbel is abundant in the ravine above Burnmouth, and, according to my friend Mr BAIRD, on the banks of the Eye, &c. The latter is a very remarkable monstrosity, distinguished for its size and beauty. The common stalk is strong, 4 or 6 inches long, bearing an umbel of about 9 flowers, each supported on a partial stalk with lanceolate bracteas at their bases. The flowers are rather less than the single ones, but the limb is equally expanded. In

one of our specimens there are two umbels on one stalk, the first placed half-way up, the second on the top; but the partial stalks of the lower one are sufficiently long to elevate the flowers to a level with the upper ones. This variety is the *P. elatior* of Dr HOOKER's Fl. Lond., according to SMITH; and probably also of Dr GREVILLE, Fl. Edin. 48, though the description is somewhat confused.

The root of this favourite flower is said to be a safe and effectual emetic; but the poet has made more use of the plant than the physician. We present our readers with a sonnet of CLARE,

"How sweet thy modest unaffected pride
Glow on the sunny bank and woods' warm side!
And where thy fairy flowers in groups are found,
The school-boy roams enchantedly along,
Plucking the fairest with a rude delight:
While the meek shepherd stops his simple song,
To gaze a moment on the pleasing sight;
O'erjoyed to see the flowers that truly bring
The welcome news of sweet returning Spring."

2. *P. veris*, leaves toothed, wrinkled, contracted towards the middle; stalk many flowered; limb of the corolla concave.
Cowslip.

Hab. Meadows and deans, common. April, May. 2/

A beautiful and well known plant, in whose bells the fancy of SHAKESPEARE has found 'a fitting bower' for the Fairy Queen, and which she has ornamented as a favourite residence.

"The Cowslips tall her pensioners be;
In their gold coats spots you see;
Those be rubies, fairy favours.
In those freckles live their savours.
I must go seek some dew-drops here,
And hang a pearl in every cowslip's ear."

66. MENYANTHES.

1. *M. trifoliata*, leaves ternate; flowers spiked, white dashed with pink, the disk of the corolla densely shaggy. *Buckbean*.

Hab. Marshes and bogs, frequent. June, July. 2/

This is perhaps the most beautiful of our native plants, equal, in the opinion of Mr CURTIS, to the *Kalmias*, the *Rhododendrons*, and the *Ericas* of foreign climates, “which are purchased at an extravagant price, and kept up with much pains and expense, while this delicate native, which might be procured without any expense, and cultivated without any trouble, blossoms unseen, and wastes its beauty in the desert air.”—An infusion of the root and leaves is much used by the common people in this neighbourhood in dyspeptic complaints. Formerly its virtues were highly extolled by many medical practitioners, and though now little used, it is apparently fully equal in strength to other bitters, and may hereafter lessen our dependence on foreign drugs. In West Bothland, in times of scarcity, the roots are ground and mixed with the corn to make bread, “qui admodum amarus est et detestabilis;” while, in other districts of Lapland and in Norway, they are given to domestic cattle, which devour them fresh, notwithstanding their bitterness.

67. LYSIMACHIA.

* *Stalks many-flowered.*

1. *L. vulgaris*, stem erect, 3 or 4 feet high; leaves ovate-lanceolate, opposite, 2-4 together; clusters panicked, terminal; flowers yellow. *Yellow Loose-strife.*

Hab. Sow-mire near Swinton, Berwickshire, Mr W. Baird.
July, Aug. 4

■ ■ *Stalks single flowered.*

2. *L. nemorum*, stem creeping; leaves ovate, acute; flowers solitary, yellow; stamens smooth. *Wood Loose-strife.*

Hab. Moist woods and watery places. Haidendean, Dr Thompson. Common in the wooded banks below Langley Ford, and in the bogs at the base of the Cheviot Hills. June—Sept. 4

68. ANAGALLIS.

1. *A. arvensis*, stem procumbent; leaves ovate, sessile, dotted beneath; corolla minutely notched, scarlet. *Scarlet Pimpernel.*

Hab. Corn fields, not common in the immediate vicinity; but it seems to have selected Holy Island as a favourite

residence, for there it grows in a profusion and beauty not to be surpassed, and elsewhere rarely equalled.
July—Sept. ☉

LORD BACON, who calls this plant the “Wincopipe,” says, that the country people believe, if its flowers open in the morning, a fair day is sure to follow; and as the belief still continues, it seems reasonable to conclude that it is founded on fact. They open at 8 A. M. and close about noon; but so sensible are they to the approach of rain, that they close even if a shower passes over.

“Such is the science to the peasant dear,
Which guides his labour through the varied year:
While he, ambitious 'mid his brother swains,
To shine, the pride and wonder of the plains,
Can in the Pimpernel's red-tinted flowers,
As close their petals, read the measured hours.” LEYDEN.

2. *A. tenella*, stem creeping; leaves roundish, somewhat pointed, stalked; stigma acute; flowers rose-coloured. *Bog Pimpernel*.

Hab. Mossy bogs rare. “Point near Bamborough,” Thomp. Haidendean, Dr Thompson. July, Aug. 7/

69. CONVULVULUS.

1. *C. arvensis*, stem climbing; leaves arrow-shaped, acute at each end; stalks mostly single-flowered; bractees minute, remote from the flower, which is rose-coloured. *Small Bindweed*.

Hab. Dry banks and fields. Ramparts; near the Shore Lime-kiln; fields opposite Spring Gardens, Thomp. Plentiful about Bamborough. June, July. 7/

2. *C. sepium*, stem climbing; leaves arrow-shaped, abrupt at the posterior lobes; stalks square, single-flowered; bractees heart-shaped, close to the white flower. *Great Bindweed*.

Hab. In hedges west of Ladykirk House, but said to have been planted there as an ornamental flower. July, Aug. 7/

The roots of this elegant climber afford a good purgative extract.

70. CAMPANULA.

1. *C. rotundifolia*, radical leaves heart or kidney shaped, crenate; stem-leaves linear, entire; flowers blue, sometimes white, drooping. *Blue Bells*.

Hab. Dry banks and heaths. July, Aug. ½

71. VIOLA.

1. *V. hirta*, stem none; leaves heart-shaped, rough with hairs as well as their foot-stalks; calyx-leaves obtuse; lateral petals with a hairy central line. *Hairy Violet*.

Hab. Grassy banks. New-mill banks, Thomp. Ravine above Burnmouth. April. ½

2. *V. palustris*, root creeping; stem none; leaves kidney-shaped, smooth; lateral petals with a hairy central line; flowers very pale, with a very short spur. *Marsh Violet*.

Hab. Mossy bogs. Near Murton Craigs, Thomp. Below Shoreswood Hall, Dr Thompson. Allerton Mill-dean. May, June. ½

3. *V. canina*, stem at length ascending, channelled; leaves oblong-heart-shaped; stipulas serrated; bractees awl-shaped, entire; calyx acute. *Dog's Violet*.

Hab. Woods and by hedges common. April, May. ½

4. *V. tricolor*, stem angular, diffuse, divided; leaves oblong, deeply crenate; stipulas lyrate, pinnatifid; bractees obsolete.

Pansy Violet.

Hab. Hedges and cultivated fields. The *V. arvensis* of some botanists, now generally considered a variety of the *tricolor*, is common in gravelly corn fields. May—Sept. ☉

This well-known flower has many synonyms in the English language, such as *Heart's-ease*, from its being imagined to possess the medicinal virtue of raising the spirits and comforting the heart; *Pansy*, from being, in the symbolical representation of flowers, expressive of the thoughts,—"There's Pansies, that's for thoughts," says poor Ophelia: *Love-in-idleness*, a very poetic account of the

origin of which we have in the following complimentary lines of SHAKSPEARE to our good Queen BESS.

—" I saw

Flying between the cold moon and the earth
Cupid all armed : a certain aim he took
At a fair vestal, throned by the west ;
And loosed his love-shaft smartly from his bow,
As it would pierce a hundred thousand hearts :
But I might see young Cupid's fiery shaft
Quench'd in the chaste beams of the wat'ry moon ;
And the imperial votress passed on,
In maiden meditation, fancy-free.
Yet marked I where the bolt of Cupid fell :
It fell upon a little western flower,—
Before milk-white ; now purple with love's wound,—
And maidens call it Love-in-idleness.
Fetch me that flower ; the herb I shew'd thee once ;
The juice of it on sleeping eye-lids laid,
Will make or man or woman madly doat
Upon the next live creature that it sees."

5. *V. lutea*, stem triangular, unbranched ; leaves ovate-oblong, crenate, fringed ; stipulas lobed, palmate ; bractees minute, scarcely toothed ; spur the length of the calyx. *Yellow Pansy*.

Hab. "About two miles south of Fastcastle," Lightfoot.
Plentiful on the banks just above Fastcastle. May—
Sept. 24

72. VERBASCUM.

1. *V. Thapsus*, stem simple ; leaves decurrent, crenate, woolly on both sides ; flowers in a dense cylindrical cluster, almost sessile, golden yellow. *Great Mullein*.

Hab. "On the bed of Till, near Wooler," Winch. July,
Aug. 8

2. *V. nigrum*, leaves oblong-heart-shaped, stalked, waved and crenate, slightly downy ; flowers in a long mostly solitary cluster, bright yellow, the filaments densely clothed with violet-coloured hairs. *Black Mullein*.

Hab. Waste ground at Ord, probably an outcast of the garden, but observed there for many successive years.
July, Aug. 24

73. HYOSCYAMUS.

1. *H. niger*, herb downy and viscid; leaves sinuated, clasping the stem; flowers sessile, of a straw-colour, pencilled with dark-purple veins. *Henbane*.

Hab. Waste grounds surrounding the town, plentiful, Thomp. Holy Island. July. ☉

The roots strung in the form of beads are the anodyne necklaces tied round the necks of children to facilitate the growth of their teeth. The leaves afford a very valuable medicine, in its general action approaching nearer to opium than any other known article. The smoke from its seeds, when applied by a funnel to a carious tooth, is recommended in severe fits of toothache. The whole herb is poisonous, but there is no danger of its being eaten. If it is the "hebenon" of SHAKSPEARE, as the commentators assert, the effects he attributes to its operation are altogether fictitious. Hamlet, Act i. sc. 5.

74. ATROPA.

1. *A. belladonna*, stem herbaceous; leaves ovate, undivided; flowers solitary, drooping, lurid purple; berries black. *Deadly Nightshade*.

Hab. "On the banks of Wooler Water, near Wooler," Winch. June. ♀

The root is presumed to be "the insane root" of SHAKSPEARE, which seems to have taken "prisoner" the reason of many of his commentators. An extract prepared from the leaves is occasionally used in medicine, and, when applied near the eye, has the remarkable property of dilating the pupils; and the still more remarkable property, if we are to credit some German physicians, of rendering those who take it insusceptible of the contagion of scarlet fever. Every part of the plant is poisonous; and numerous instances have occurred where children, and the ignorant, allured by the tempting appearance of the berries, have fallen victims to their deadly power. BUCHANAN relates that the Scots, in the reign of DUNCAN I., during an amnesty, sent to SUEÑO and his army a great quantity of bread, together with wine and ale, into which had been infused the juice of this herb, which then grew abundantly in Scotland. The Danes, suspecting no guile, partook liberally of the gift, and when intoxicated by the noxious juice, easily fell a prey to those they had invaded,

75. SOLANUM.

1. *S. dulcamara*, stem climbing, shrubby, zigzag, without thorns; lower leaves heart-shaped, upper ones hastate; clusters cymose, opposite the leaves or terminal, drooping; flowers purple, with two green spots at the base of each segment; berries oval, scarlet. *Woody Nightshade*.

Hab. Moist hedges and thickets not uncommon. Near the mouth of the Whiteadder; turnpike at Haggerston, and beyond Lowlin, Thomp. Allerton Mildean, &c. June, July. 4

The berries are tempting to children and poisonous, though not so powerful as those of *Atropa*. A decoction of the leaves and twigs is one of the most effectual remedies for leprosy.

76. ERYTHRÆA.

1. *E. centaurium*, stem nearly simple; leaves ovate-lanceolate; flowers rose-coloured, nearly sessile, in a forked corymbose panicle; calyx half the length of the tube, its segments partly combined by a membrane. *Common Centaury*.

Hab. Dry pastures not uncommon. Sea-banks from Dodd's Well to Lamberton Shields; Newmill banks, Thomp. July, Aug. ☉

Once celebrated for its medicinal virtues, and thus, through JOANNES POSTIUS, it speaketh—

“Flos mihi suave rubet, sed inest quoque succus amarus,
Qui juvat obsessum bile, aperitque jecur.”

A distich which, with not inferior elegance, GERARDE thus englishes—

“My floure is sweet in smell, bitter my iuyce in taste,
Which purge choler, and helps liver, that else would waste.”

GERARDE tells us somewhere he was “no graduate, but a countrey scholler,” and we acquit the honest man of leasing!

2. *E. littoralis*, stem simple or much branched, 2 or 3 inches high; leaves linear-obovate, obscurely three-ribbed; flowers

densely corymbose, nearly sessile; calyx as long as the tube, its segments combined below. *Sea-Centauray.*

Hab. On the Links south of Bamborough Castle, and on Holy Island plentiful, Winch. June, July. ☉

77. SAMOLUS.

1. *S. Valerandi*, stem 8 or 10 inches high, smooth; leaves ovate, obtuse; clusters corymbose, many-flowered; flowers small, white; bracteas solitary, in the middle of each partial stalk. *Common Brook-weed.*

Hab. Marshy places. "On the coast at Bamborough," Winch. Low moist spots on Holy Island Links, Thomp. "Wet rocks on the sea banks near Guns-green," Mr A. Baird. July. ♀

78. LONICERA.

1. *L. Periclymenum*, leaves all separate, deciduous; heads of flowers ovate, imbricated, terminal; flowers ringent. *Common Honeysuckle.*

Hab. Hedges and thickets, common, intertwining with other shrubs, and

"Recompensing well
The strength it borrows with the grace it lends."

July. ♀

The woodbine of the poets, though likewise the "twisted eglantine" of MILTON. The phenomena observed in its growth have been adduced in favour of the existence of a "perceptive power" in vegetables. They are certainly curious. The branches shoot out longitudinally, till they become unable to bear their own weight; and then strengthen themselves by changing their form into a spiral. When they meet with other living branches of the same kind, they coalesce for mutual support, and one spiral turns to the right, and the other to the left, thus seeking, by an instinctive impulse, some body on which to climb, and increasing the probability of finding one by the diversity of their course: for, if the auxiliary branch be dead, the other uniformly winds itself round from the right to the left."—DR PERCIVAL.

79. EUONYMUS.

1. *E. europæus*, branches smooth and even; leaves ovate-lanceolate, on short stalks; peduncles compressed, many-flowered; flowers mostly 4-cleft and tetrandrous. *Spindle-tree*.

Hab. "Ash-wood, Belford," Thomp. May. 12

80. RIBES.

1. *R. grossularia*, branches prickly; leaves rounded and lobed; stalks single-flowered; bractæ close together; segments of the calyx reflexed, shorter than the tube. *Gooseberry*.

Hab. Frequent in woods and hedges, where it may have been planted. In a deep glen about one mile south of Fastcastle, Rev. A. Baird. Banks of the Tweed at Herculiffe. April. 12

81. HEDERA.

1. *H. helix*, leaves some ovate, some lobed. *Ivy*.

Hab. In deans on rocks and trees. Oct.

It is generally believed that the ivy is extremely injurious to those trees which it entwines and clothes with a verdure more beautiful than their own. Hence Prospero, in the "Tempest," says of his brother,

" He was
The Ivy, which had hid my princely trunk
An' suck'd my verdure out on't."

But there is reason to think that the evil effects have been exaggerated, for in general it seldom invests the tree closely until, from age or disease, its vigour has begun to languish. No plant has been a more fertile source to the poet of beautiful imagery or of illustrative similes, but these we need not particularize, since they must be familiar to every reader of English poetry. We may, however, transfer to our page the following verses addressed by B. BARTON to Mrs HEMANS, who also has an excellent Ode to the Ivy, since they are correct and descriptive:

" And can those flowers, that bloom to fade,
For thee a fitting wreath appear?
No! wear thou, then, the ivy-braid,
Whose leaves are never sere!

It is not gloomy ; brightly play
 The sunbeams on its glossy green ;
 And softly on it sleeps the ray
 Of moonlight, all serene.

It changes not, as seasons flow
 In changeful, silent course along ;
 Spring finds it verdant, leaves it so ;
 It outlives summer's song ;
 Autumn no wan, or russet stain
 Upon its fadeless glory flings ;
 And winter o'er it sweeps in vain,
 With tempest on his wings."

* * * * *

" Hast thou seen in winter's stormiest day
 The trunk of a blighted oak,
 Not dead, but sinking in slow decay
 Beneath time's resistless stroke,
 Round which a luxuriant Ivy had grown,
 And wreathed it with verdure no longer its own ?

Perchance thou hast seen this sight, and then,
 As I at thy years might do,
 Passed carelessly by, nor turned again
 That scathed wreck to view.
 But now I can draw from that perishing tree
 Thoughts which are soothing and dear to me.

O smile not ! nor think it a worthless thing
 If it be with instruction fraught ;
 That which will closest and longest cling
 Is alone worth a serious thought !
 Should aught be unlovely which thus can shed
 Grace on the dying, and leaves on the dead ?"

82. GLAUX.

1. *G. maritima*. Sea Milkwort.

Hab. Muddy places on the sea-coast to the southward ;
 and sides of the Tweed above the Bridge. June, July.

4

Root long, jointed, with fibres proceeding from the articulations. Herb smooth, succulent. Stems decumbent at the base, then erect, round, green, generally coloured below, from 2 to 6 inches high. Leaves opposite, sometimes becoming alternate, sessile, ovate, marked with impressed punctures on the upper surface. Flowers axillary, subsessile, prettily speckled with reddish spots.

II. DIGYNIA.

83. CHENOPODIUM.

1. *Ch. Bonus Henricus*, leaves triangular arrow-shaped, entire; spikes compound, terminal and axillary, erect, leafless. *Mercury Goosefoot*.

Hab. Waste grounds about villages. Aug. 7/

While young and tender, the leaves are used as a substitute for spinage, for which purpose, CURTIS observes, it is cultivated in Lincolnshire, in preference to the garden sort. WITHERING observes, that the young shoots, peeled and boiled, may be eaten as asparagus, which they resemble in flavour.

2. *Ch. rubrum*, leaves triangular, somewhat rhomboid, deeply toothed and sinuated; spikes erect, compound, leafy; seed very minute. *Red Goosefoot*.

Hab. Waste grounds frequent. Aug. Sept. ☉

3. *Ch. murale*, leaves ovate, acute, many-toothed, shining; spikes aggregate, paniced, cymose, leafless. *Nettle-leaved Goosefoot*.

Hab. Waste ground. "Holy Island, between the town and castle," Thomp. Aug. Sept. ☉

4. *Ch. album*, leaves rhomboid-ovate, jagged, mealy, entire towards the base, upper ones oblong, entire; seed quite smooth; spikes interrupted, partly leafy, not much branched. *White Goosefoot*.

Hab. Cultivated fields, common. Aug. ☉

5. *Ch. maritimum*, leaves entire, awl-shaped, semi-cylindrical, fleshy; flowers axillary, sessile. *Sea Goosefoot*.

Hab. Sea-shore. "Coast beyond Beal," Thomp. Holy Island. July, Aug.

84. SALSOLA.

1. *S. Kali*, herbaceous, decumbent, and very bushy; leaves awl-shaped, spinous-pointed, rough; calyx with a dilated margin. *Prickly Saltwort*.

Hab. Sandy sea-shores frequent. July. ☉

One of the plants from which, in Spain, barilla is manufactured.

85. ULMUS.

1. *U. montana*, leaves broadly elliptical, pointed, rough, doubly serrated; flowers stalked, loosely tufted, 5 or 6-cleft; capsule somewhat orbicular, slightly cloven, naked; branches drooping, their bark even. *Broad-leaved Elm*.

Hab. Woods and hedges. April.

86. GENTIANA.

1. *G. Amarella*, stem flowering from top to bottom, with short axillary branches; corolla purplish, salver-shaped, 5-cleft, bearded in the throat; segments of the calyx nearly equal. *Autumnal Gentian*.

Hab. "Links below Scrammerston, and on Holy Island; Links south of Bamborough," Thomp. Ancroft Moor. Aug. ☉

2. *G. campestris*, stem somewhat corymbose; corolla purplish, salver-shaped, 4-cleft, bearded in the throat; two outer segments of the calyx ovate, very large. *Field Gentian*.

Hab. Green pastures. Near Genesis Gull-hole; banks beyond Spittal; Links at Goswick, and "below Budle," Thomp. Ancroft Moor, and very plentiful on Cheviot and the adjacent hills. Aug. ☉

87. SANICULA.

1. *S. Europæa*, radical leaves simple, deeply lobed; flowers all nearly sessile, cream-coloured, in little capitate umbels. *Wood Sanicle*.

Hab. Woods frequent. Longridge Dean. Fenwick Wood, and hedges between it and Detchant. June. ♀

88. DAUCUS.

1. *D. carota*, stem hispid; leaves 2 or 3 pinnate, leaflets pinnatifid with linear-lanceolate acute segments; fruit-bearing umbel concave; bristles of the seeds slender. *Wild Carrot*.

Hab. Borders of fields and roads. July. ♂

The root is frequently eaten by the Highlanders, who consider it wholesome and nutritious. A comparison of it in the wild and cultivated state is a good illustration of the powers of cultivation, in rendering a useless weed one of our most esteemed culinary vegetables, for the garden carrot is merely a variety of the wild.

89. TORILIS.

1. *T. Anthriscus*, stem erect, with nearly upright branches; leaves bipinnate, leaflets pinnatifid; umbels of many close rays, with numerous general bracteas. *Upright Hedge-parsley*.

Hab. Hedges and borders of fields. Aug. ☉

2. *T. nodosa*, stem prostrate, rough; umbels lateral, simple, nearly sessile; fruit partly granulated. *Knotted Hedge-parsley*.

Hab. Gravelly fields near Oxford, plentiful. Holy Island, on the Heugh and Castle rock. June. ☉

90. ANTHRISCUS.

1. *A. vulgaris*, stem smooth, swelled under each joint; leaves triply pinnate, pinnatifid, light green, hairy; fruit ovate, twice the length of its beak. *Common Beaked-parsley*.

Hab. Road sides common. June. ☉

91. SCANDIX.

1. *S. pecten-veneris*, leaves triply pinnatifid, with linear acute smooth segments; umbels small, simple, solitary, or in pairs; bracteas jagged; petals inflexed at the point; fruit nearly smooth, with a very long bristly-edged beak. *Shepherd's-needle*.

Hab. Corn-fields, common. June-Sept. ☉

92. CHÆROPHYLLUM.

1. *C. sylvestre*, stem striated, smooth, 3 feet high, somewhat swelled below the joints; leaves triply pinnate, leaflets pinnatifid; umbels terminal, stalked; bractæas ovate, membranous. *Smooth Cow-parsley.*

Hab. Under hedges and woods. May, June. 7/

93. MYRRHIS.

1. *M. temulenta*, stem rough, spotted, swelled under each joint; leaves bipinnate, leaflets pinnatifid, hairy; umbels drooping before flowering, the rays hairy; seeds furrowed, nearly smooth. *Rough Cicely.*

Hab. Hedges common. June, July. 7/

94. BUNIAM.

1. *B. flexuosum*, stem tapering and zigzag at the base, smooth; leaves tripinnate, smooth, with linear entire segments; general bractæas scarcely 3; fruit somewhat beaked. *Earth-nut.*

Hab. Pastures and corn-fields. June. 7/

The roots are bulbous, and taste like a chesnut. Many persons are fond of them, and in some parts of England, says LIGHTFOOT, they boil them in broth, and serve them up to table. Children only eat them in this neighbourhood, though perhaps they are not inferior to the chesnut. In Sweden they are an article of commerce.

95. SIUM.

(*Acrid and dangerous herbs, smooth in every part, aquatic and perennial.*)

1. *S. angustifolium*, stem erect, striated; leaves pinnate, leaflets unequally lobed and serrated; umbels stalked, opposite to the leaves. *Narrow-leaved Water-parsnip.*

Hab. Ditches and rivulets, rare. In a small bog near Netherbyres, Rev. A. Baird. Near the Carding-Mill at Wooler. July, Aug.

2. *S. nodiflorum*, stem procumbent ; leaves pinnate, leaflets ovate, equally serrated ; umbels nearly sessile, opposite to the leaves. *Procumbent Water-parsnip*.

Hab. Ditches and rivulets, frequent. Aug.

3. *S. inundatum*, stem procumbent or floating ; leaves pinnate, cut, the lowermost in many compound capillary segments ; umbels 5-flowered, in pairs. *Least Water-parsnip*.

Hab. Ponds. Below Calf-hill, plentiful, Thomp. On St. Abb's Head ; and in small ponds on Coldingham Moor. June, July.

96. ÆTHUSA.

1. *Æ. cynapium*, smooth, erect, branched ; leaves uniform, leaflets wedge-shaped, decurrent, with lanceolate segments. *Fool's-parsley*.

Hab. Corn fields and meadows. July, Aug. ☉

This is easily distinguished from all its tribe by the few long pendulous bracteas under each partial umbel ; and it is of consequence to distinguish it from parsley, as it is of a "naughty smell," and considered poisonous.

97. CONIUM.

1. *C. maculatum*, stem polished and spotted, much branched. *Common Hemlock*.

Hab. Hedges and waste grounds. July. ♂.

A valuable medicinal plant, but frequently rendered inert from want of attention to the proper period of collecting it, or from errors in its preparation. GERARDE hath a horror of it, positively forbidding its use, "for it is one of the deadly poysons which killeth by his cold qualitie." The poison which SOCRATES was condemned to drink is generally said to have been the juice of the hemlock, but this is very doubtful.

98. ŒNANTHE.

1. *Œ. crocata*, herb smooth ; stem branched, furrowed, 2 to 5 feet high ; leaves doubly pinnate, leaflets all wedge-shaped, many-cleft, nearly uniform ; umbels rather large, terminal ; fruit

linear-oblong, with slender intermediate ribs. *Hemlock Water-dropwort*.

Hab. Watery places, frequent. July. 2

One of the most virulent poisons we possess in our fields; and many instances are recorded of fatal effects having followed the eating of its roots. "Beware and take good heed of this, and such like simples; for there is no physician that will give it, because there be many other excellent good simples which GOD hath bestowed vpon vs, for the preventing and curing of diseases." Despite this advice of the pious GERARDE, modern physicians have given an infusion of the leaves, or the juice of the roots, in leprosy, with benefit. Goats eat the plant with impunity.

99. SMYRNIUM.

1. *S. olusatrum*, smooth; stem 2 or 3 feet high, furrowed; stem-leaves ternate, stalked, serrated; flowers yellow-green, in dense numerous rounded umbels. *Alexanders*.

Hab. "In Scotiæ littoreis rupibus non procul Bervico,"

Ray. "Upon the sea-coast at Dunglass, on the edge of Berwickshire," Dr Parsons. May, June. ♂

100. ÆGOPODIUM.

1. *Æ. podagraria*, root creeping; stem 1-2 feet high, smooth, furrowed; lower leaves twice ternate, upper simply ternate; leaflets ovate, large, serrated. *Gout-weed*.

Hab. Under hedges in moist situations; frequent in this neighbourhood. June. 2

101. ANGELICA.

1. *A. sylvestris*, stem smooth, purplish; leaves doubly pinnate; leaflets ovate, equal, serrated; rays of the umbels downy. *Wild Angelica*.

Hab. Moist meadows and bogs, common. July. 2

102. LIGUSTICUM.

1. *L. Scoticum*, stem 1 foot high, smooth, striated; lower leaves twice ternate, uppermost simply ternate; leaflets broadly ovate,

serrated; umbels terminal, smooth, not very large. *Scottish Lowage.*

Hab. "Sea-shore at Lamberton Shields," Thomp. Shore at Eyemouth. Mr A. Baird. On rocks between Fastcastle and Redheugh. July. 2/

The leaves when bruised have the smell of parsley. "The herb is eaten, either crude or boiled, by the natives of Shetland and its isles. The flavour is highly acrid, and though aromatic, and perhaps not unwholesome, very nauseous to those who are unaccustomed to such food." Sm. The root is considered a good carminative, and is said to have proved very beneficial in abdominal swellings.

103. PIMPINELLA.

1. *P. saxifraga*, stems a foot high, striated; leaves pinnate, leaflets of the radical ones roundish, of the uppermost in various linear segments; umbels drooping when young. *Common Burnet-saxifrage.*

Hab. Dry pastures, common. July, Aug. 2/

A variety with the radical leaves doubly pinnatifid, is common in shaded places.

104. CNIDIUM.

1. *C. silaus*, smooth, dark-green; stem erect, branched; leaves doubly pinnate; leaflets deeply pinnatifid, their segments opposite, decurrent; general bractees 1 or 2; umbellules small, distant; flowers yellowish. *Meadow Pepper-saxifrage.*

Hab. Sides of roads and borders of fields, in rather moist places, common in Berwickshire; and not rare in the north of Durham. Aug. Sept. 2/

105. HYDROCOTYLE.

1. *H. vulgaris*, stems creeping; leaves orbicular, peltate, smooth, cloven at the base; umbels very small, somewhat aggregate; flowers nearly sessile. *Common White-rot.*

Hab. Bogs and marshy places, frequent. Murton Craigs, Thomp. Below Shoreswood Hall; Haiden Dean, Dr Thompson. Holy Island Loch, &c. June, July. 2/

106. HERACLEUM.

1. *H. sphondylium*, rough, hairy; stem 3 or 4 feet high, furrowed; leaves large, pinnate; leaflets pinnatifid, cut, and serrated. *Common Cow-parsnip.*

Hab. Borders of fields and moist meadows. July. ♂

“I have fed,” says Mr COBBETT, “working-horses, six or eight in number, upon this plant for weeks together. Hogs, cows, and horses, are equally fond of it. Many a half-starved pig have I seen within a few yards of cart-loads of this pig-meat! This arises from want of the early habit of attention to such matters.”

III. TRIGYNIA.

107. VIBURNUM.

1. *V. opulus*, leaves smooth, 3-lobed, unequally serrated foot-stalks beset with glands; flowers white in terminal cymes. *Common Guelder-rose.*

Hab. Moist woods and hedges. Fenwick Wood. On the road to Norham, about five miles from Berwick. June.
h

The *Snow-ball* tree is a cultivated variety, commonly planted in shrubberies, along with the Lilac and Laburnum, grouping elegantly with the various purple hues of the former, and the “golden chain” of the latter; but they are all mere summer beauties, nor does any thing profitable or ornamental follow. *Sm.*

108. SAMBUCUS.

1. *S. nigra*, stem arboreous; leaflets ovate; stipulas obsolete; cymes with 5 main branches. *Common Elder.*

Hab. Hedges and woods. June. h

BOERHAAVE asserts, that the expressed juice of the Common Elder, from a drachm to half an ounce at a dose, is the most valuable of all hydrogogue medicines, where the viscera are sound. GERARDE had said the same thing

before, and the assertion is, in a great measure, confirmed by SYDENHAM. It has fallen into disuse. Elder flowers make an agreeable light wine, and they are peculiarly excellent for giving flavour to white currant wine, being added at the time of a slight fermentation, which takes place in April of the year following that of the manufacture.—NEILL. The berries are esteemed by the good housewives of the south for making elder-rob, good for quinzies, colds, and so forth; and the village quack still works wonders with his elder salve. The cluster of flower-buds is said to make a delicious pickle to eat with boiled mutton.

IV. TETRAGYNIA.

109. PARNASSIA.

1. *P. palustris*, stem 1-flowered; leaves heart-shaped; flowers white, with pellucid veins; bristles of each nectary numerous. *Grass of Parnassus*.

Hab. "Mr William Broad observed it to grow plentifully in the Castle-fields of Berwicke-vpon-Tweed," Gerard; and there it still grows. Holy Island Links, Winch. Common in this neighbourhood, particularly on moors, making glad the desert and the waste. Aug. Sept. ʒ

V. PENTAGYNIA.

110. STATICE.

1. *S. Armeria*, leaves linear; stalks simple, bearing a round head of flowers; awns of the calyx minute. *Thrift*.

Hab. The sea-shore, common. July, Aug. ʒ

The flowers are usually rose-coloured, but a white variety grows in abundance at the Needle-Eye. We have found a specimen in which the stalk was terminated with two bunches of leaves similar to those of the root, but shorter. Mr NEILL says that the thick tuberous roots, sliced and

boiled with milk, were formerly highly prized in Orkney, as a remedy in pulmonary consumption.

2. *S. limonium*, stalks paniced, round; spikes level-topped; flowers fine blue; leaves elliptic-oblong, single-ribbed, smooth, with a small point. *Sea Lavender*.

Hab. St Cuthbert's, Holy Island, plentiful, Thomp.
Aug. 7

111. LINUM.

1. *L. catharticum*, leaves opposite, obovate-lanceolate; stem slender, dichotomous above; flowers gracefully drooping before expansion, white, small; the petals acute. *Purging-flax*.

Hab. Dry pastures, common. June, July. ☉

“Two ounces of this plant, infused in a pint of water, forms an infusion, which we frequently administer to delicate subjects as a valuable indigenous tonic purgative. A wine-glassful, taken twice a-day, generally succeeds in keeping the bowels in a soluble condition.”—*Medical Botany*.

VI. HEXAGYNIA.

112. DROSERA.

1. *D. rotundifolia*, leaves depressed, nearly orbicular, covered with red glandular hairs, on hairy footstalks; flower-stalks radical, racemose; flowers white, unilateral. *Round-leaved Sun-dew*.

Hab. Turfy bogs on moors. Lamberton Moor, Haiden Dean, &c. July, Aug. 7

The leaves, when irritated on the upper surface by an insect settling on them, or any similar cause, immediately fold themselves up, and entrap their prey. I have not witnessed this curious phenomenon; but the facts detailed by Dr WITHERING satisfactorily prove its existence, though probably the plant may possess the capability of doing so only at particular hours, or in the height of its vigour.

CLASS VI.

HEXANDRIA.

“ He, when young Spring protrudes the bursting gems,
 Marks the first bud, and sucks the healthful gale
 Into his freshen'd soul ; her genial hours
 He full enjoys ; and not a beauty blows,
 And not an opening blossom breathes in vain.”

THOMSON.

“ Abundant and diversified above
 All number, were the sources of delight ;

* * * * *

One made acquaintanceship with plants and flowers,
 And happy grew in telling all their names.”

POLLOCK.

I. MONOGYNIA.

* *Flower with both calyx and corolla.*

119. **BERBERIS.** *Corolla* of 6 petals ; *calyx* of 6 leaves, inferior ;
berry with 2 seeds.

* * *Flower without a calyx, inferior.*

116. **CONVALLARIA.** *Corolla* inferior, deciduous, the limb in 6
 segments ; *berry* of 3 cells ; *stigma* triangular.

113. **ALLIUM.** *Corolla* inferior, of 6 ovate petals ; *stamens* awl-
 shaped, flattened ; *stigma* acute ; *seeds* angular.

115. *NARTHECIUM*. *Corolla* inferior, of 6 linear-lanceolate petals, spreading; *stamens* wooly; *seeds* tunicated, tapering at each end.

114. *SCILLA*. *Corolla* inferior, of 6 ovate oblong petals, spreading, deciduous; *stamens* all thread-shaped.

* * * *Flower without petals.*

117. *JUNCUS*. *Calyx* of 6 leaves; *capsule* of 3 cells and 3 valves; *seeds* numerous, horizontal.

118. *LUCIOLA*. *Calyx* of 6 leaves; *capsule* of 1 cell and 3 valves; *seeds* 3, erect.

II. TRIGYNIA.

121. *TRIGLOCHIN*. *Calyx* of 3 leaves; *petals* 3; *capsule* opening at the base, with 3 valves. (Marsh herbs, with copious radical linear leaves, and a stalked oblong cluster of numerous small green flowers.)

120. *RUMEX*. *Calyx* of 3 leaves; *petals* 3; *seed* 1, naked, triangular. (Flowers numerous, green, in whorled clusters.)

III. POLYGYNIA.

122. *ALISMA*. *Calyx* of 3 leaves; *petals* 3; *capsules* 6, or more, aggregate; *seeds* 1 or 2.

I. MONOGYNIA.

113. *ALLIUM*.

* *Stem leafy; leaves flat.*

1. *A. arenarium*, stem 2 or 3 feet high; leaves with cylindrical sheaths; bracteas obtuse; flowers deep red, in a globose bulbiferous umbel; keel of the petals roughish; 3 alternate stamens dilated, 3-cleft. *Sand Garlick*.

Hab. Mouth of the Whiteadder, plentiful. July. 7/

* * Stem leafy; leaves somewhat cylindrical.

2. *A. oleracium*, stem 2 feet high, slender; leaves semi-cylindrical, tubular, rough, channelled above, ribbed beneath; bracteas pointed, longer than the lax bulbiferous umbel; stamens simple, awl-shaped. *Field Garlic*.

Hab. On the Heugh, Holy Island, Winch. On the rocks at Spindlestone. July. 7/

3. *A. vineale*, stem slender, 1 or 2 feet high; leaves cylindrical, smooth; umbel spherical, bearing bulbs; 3 alternate stamens deeply 3-cleft. *Crow Garlic*.

Hab. Dry pastures. Wind-mill Bastion, and other parts of the Ramparts, Thomp. Castle-hills. Dikes in the Magdalen Fields. July. 7/

* * * Stalk radical, naked.

4. *A. ursinum*, stalk semicylindrical; leaves elliptic-lanceolate, stalked: flowers pure-white, in a level-topped umbel; stamens simple. *Broad-leaved Garlic*.

Hab. Moist woods. Banks of the Whiteadder between Edrington and Mackay's Mill, Dr Thompson. Fenwick Wood. June. 7/

5. *A. schœnoprassum*, stalk round, the height of the foliage; leaves cylindrical, somewhat tapering at the point; flowers purplish, in a dense umbel; stamens simple. *Chive Garlic*.

Hab. "By Fastcastle," Dr Parsons. June. 7/

A rare plant in a wild state, but common in gardens. Used in sallads, but, says GERARDE, "they cause troublesome dreames."

114. SCILLA.

1. *S. verna*, bulb coated; leaves linear, channelled; coromb hemispherical, of few deep blue flowers; bracteas lanceolate, obtuse. *Vernal Squill*.

Hab. Sea banks at Gunsgreen, plentiful, an interesting discovery of my friend Mr A. Baird. April. 7/

2. *S. nutans*, leaves linear; cluster drooping; flowers blue, pendulous, cylindrical-bell-shaped, the points of their petals reflexed; bracteas in pairs. *Wild Hyacinth*.

Hab. In woods and deans, common. May. 7/

115. NARTHECIUM.

1. *N. ossifragum*, stem simple, leafy; leaves sword-shaped; cluster terminal, erect, many-flowered; flowers yellow. *Bog-asphodel*.

Hab. Turfy bogs on moors, frequent. Murton Craigs; Moors west of Belford, Thomp. Haiden Dean, &c. July, Aug. 7/

116. CONVALLARIA.

1. *C. polygonatum*, leaves alternate, clasping the angular stem; stalks axillary, mostly single-flowered; flowers pendulous, green and white, sweet-scented, the segments bearded; stamens smooth. *Angular Solomon's Seal*.

Hab. "On Kylloe Rocks, a few miles south of Berwick," Mr A. Bruce. May, June. 7/

117. JUNCUS.

* *Leaves none.*

1. *J. glaucus*, stem straight, glaucous, rigid, striated; panicle much branched, lax, erect, far below the summit; capsule elliptical, pointed, rather shorter than the calyx. *Hard Rush*.

Hab. Wet pastures, and by road-sides. July. 7/

2. *J. conglomeratus*, stem straight, faintly striated, soft; panicle much branched, dense, globular, far below the summit; capsule abrupt; stamens 3. *Common Rush*.

Hab. Wet pastures, meadows, and by ditches, July. 7/

3. *J. effusus*, stem straight, faintly striated, soft; panicle loose, repeatedly compound, very far below the summit; capsule obtuse. *Soft Rush*.

Hab. Wet pastures, by road-sides and rivulets. July. 7/

In the olden time, it was customary, at ceremonial entertainments, to strew the floor with rushes. Chambers, in the houses of the great, were formerly strewn in this manner. As our ancestors rarely washed their floors, disguises of uncleanness became necessary things. They were, in subsequent times, formed into mats and chair-bottoms; but their use has been superseded by the knowledge of better materials. Our fishermen and labourers, in many parts of the country, carefully peel the stalk, and use the pith as a wick for their candles, or for the lamp. Mr WHITE, in his Natural History of Selborne, has given a long account of the manner of preparing them in Hampshire; and he recommends that two ribs of the rind should be left to support the pith instead of *one*, as is the case with those prepared for rush-lights. Made, as he directs, these rushes give a good clear light, while watch-lights only render "darkness visible."

• • *Herb leafy.*

4. *J. squarrosus*, stem naked; leaves numerous, radical, rigid, linear, channelled; panicle terminal, compound, with cymose branches. *Moss Rush.*

Hab. Moorish heathy ground, common. July. 2/

5. *J. cœnosus*, stem simple, leafy; leaves linear, channelled; panicle cymose, terminal, longer than the bractea; capsule obovate, the length of the rather obtuse calyx. *Mud Rush.*

Hab. Muddy places towards the sea. River sides from the bridge upwards; mouth of the rivulet at Goswick; coast beyond Goswick, Thomp. July, Aug. 2/

In our specimens, neither the calyx nor capsule are of the dark-brown colour mentioned by SMITH; and the capsule, in the same plant, is sometimes as long as the calyx, but more often rather longer. In these characters, then, they approximate nearer to the *J. compressus*; but the stem inclines to triangular on the upper part, the leaves are striated externally, and the panicle is longer than, and not overtopped by the bractea, while the peculiar habitat leaves no doubt concerning the species to which they ought to be referred. Dr HOOKER is surely right in considering *J. compressus* and *cœnosus* as varieties.

6. *J. bufonius*, stem leafy; leaves linear, angular, channelled panicle forked, racemose, longer than the bractea; flowers soli-

tary, unilateral, mostly sessile ; calyx-leaves lanceolate, taper-pointed, membranous, 2-ribbed, longer than the oblong capsule.

Toad Rush.

Hab. Abundant on all moist gravelly places, covered with water during winter, and at the sides of ponds, July, Aug. ☉

7. *J. uliginosus*, stem leafy, bulbous at the base ; leaves bristle-shaped, channelled ; flowers usually 3 together, in small lateral or terminal heads, with leafy bracteas ; capsule obtuse, rather longer than the calyx. *Little Bulbous Rush.*

Hab. Boggy places in moors, common. Lamberton Moor. Bog below Shoreswood-Hall. Haiden and Allerton-Mill Deans, &c. June, July. ♀

Almost uniformly viviparous, whether the stems be erect or decumbent. A very distinct species.

8. *J. acutiflorus*, leaves slightly compressed, divided internally by numerous transverse partitions ; panicle repeatedly compound, forked ; calyx-leaves all bristle-pointed, shorter than the taper beak of the capsule. *Sharp-flowered Rush.*

Hab. Watery places, common. July. ♀

9. *J. lampocarpus*, leaves compressed, with numerous internal partitions ; panicle erect, compound, forked ; inner calyx-leaves bordered ; capsule ovate, of a dark chocolate colour, highly polished, longer than the calyx. *Shining-fruited Rush.*

Hab. Boggy meadows, frequent. In the field below the Old Lamberton Toll. Lamberton Moor. Ancroft Moor, &c. July, Aug. ♀

118. LUCIOLA.

1. *L. pilosa*, stem a span high, leafy ; leaves hairy ; panicle cymose, widely spreading and reflexed ; flowers solitary ; capsule pointless ; crest of the seeds hooked. *Hairy Wood-rush.*

Hab. Deans, on grassy banks, common. Banks beyond Hudshead. Longridge Dean, &c. April. ♀

2. *L. sylvatica*, stems 12 or 18 inches high, leafy ; leaves hairy ; panicle cymose, doubly compound ; flowers and bracteas aggre-



LUCIDLA SIDETIVA.



gate ; capsule pointed : crest of the seeds obsolete. *Great Wood-rush.*

Hab. Woods, deans, and heaths, common. May, June.
 74

3. *L. campestris*, stem 3-10 inches high, leafy ; leaves hairy ; panicle of 3 or 4 ovate, dense, partly stalked clusters ; capsule obovate, obtuse, with a small point, shorter than the calyx ; seeds stalked, without a crest. *Field Wood-rush.*

Hab. Dry barren pastures. April, May. 74

In pastures, this species does not exceed three or four inches in height ; but in bogs it rises a foot or more. Sometimes the heads of flowers are collected into a dense head ; in other specimens two or more of them are elevated on short stalks ; but, in all, the segments of the calyx are much longer than the capsule, and less mucronate than in the following :—

4. *L. sudetica*, leaves smooth, with hairy sheaths ; clusters stalked, umbellate, the middle one sessile ; segments of the calyx mucronate, as long as the capsule. “*Juncus sudeticus*, Willdenow, Sp. Pl. ii. 221.” *J. liniger*, Purton Mid. Fl. iii. 352, t. 9.

Hab. Rough bogs. In the field below the Old Lamberton Toll. June. 74

Stem a foot high, slender, leafy, smooth ; leaves flat, smooth, the margins near the base loosely fringed with long white hairs, of which there is also a dense tuft at the top of the sheaths, which are otherwise smooth. Clusters 7, oblong, spreading ; one on a stalk two inches long, and equal to the foliaceous bractea, the rest on stalks about an inch long, except the centre one which is sessile. Segments of the calyx ovate-lanceolate, pointed, dark-brown, with membranous edges. Capsules obtuse, glossy-brown, as long as the calyx.

Mr WINCH, to whom I am indebted for the character and synonym of WILLDENOW, says, my specimen is similar to specimens purchased of SCHLEICHER, for *L. sudetica*. He has gathered it in various places in the north of England and in Scotland. It is certainly the *L. congesta* of SMITH, Eng. Fl. ii. 181, who quotes with merited approbation the figure of PURTON.

119. BERBERIS.

1. *B. vulgaris*, leaves obovate-oblong, with bristly serratures ; thorns 3-cleft ; clusters pendulous, flowers yellow ; petals entire. *Common Barberry.*

Hab. Hedges occasionally. Between Richardson's-stead and Scrammerston. Near Gainslaw. June. ♀

The leaves are in general more or less covered with a small orange-coloured fungus, whence seems to have originated an opinion, entertained by many practical farmers, that the barberry is injurious to corn, by infecting it with the mildew. To determine the accuracy of this opinion, it should first be proved that the mildew of the barberry and of corn is owing to the same species of fungus.

The flowers are worthy the attention of the student. The inner part of each filament, near the bottom, is so irritable, that, when touched by any extraneous body, it immediately contracts, and strikes its anther, full of pollen, against the stigma. A fuller account of this curious circumstance the student will find in SMITH's Introduction, p. 248; and the reflections which it is calculated to raise would be misplaced here.

II. TRIGYNIA.

120. RUMEX.

* *Flowers all perfect.*

1. *R. sanguineus*, leaves lanceolate, acute, (veined with red), the radical ones heart-shaped at the base; permanent petals entire, oblong, one of them at least tuberculated. *Bloody-veined Dock.*

Hab. Woods at Netherbyres, Berwickshire, plentiful, Rev. A. Baird. July. ♀

2. *R. crispus*, leaves lanceolate, acute, undulated and crisped at the edges; permanent petals ovate, entire, all tuberculated. *Curled Dock.*

Hab. Waste ground and road sides. July. ♀

3. *R. acutus*, leaves oblong-heart-shaped, pointed; clusters leafy; permanent petals oblong, obscurely toothed, all tuberculated. *Sharp Dock.*

Hab. Watery places. Sides of the pond below Calf-hill; and of the footpath above the Old Castle. July. ♀

4. *R. obtusifolius*, stem roughish; radical leaves heart-shaped, obtuse; permanent petals toothed, one principally tuberculated.
Common Dock.

Hab. Waste ground and pastures. July, Aug. 2/

* * *Flowers separated.*

5. *R. acetosa*, leaves oblong, arrow-shaped; flowers dioecious; permanent petals tuberculated. *Common Sorrel.*

Hab. Meadows and pastures. June. 2/

The leaves are an agreeable acid; and in France the plant is commonly cultivated for use at the table. The Laplanders mix a strong decoction of the leaves with their rein-deer milk, which is then capable of being preserved for use from autumn till the ensuing summer, and esteemed as an agreeable and wholesome food.

6. *R. acetosella*, leaves lanceolate, hastate; flowers dioecious; permanent petals without tubercles. *Sheep's Sorrel.*

Hab. Barren pastures and on heaths. June, July. 2/

TOFIELDIA palustris was found by RAY "juxta rivulum non procul *Bervico* in Scotia." Syn. 375. We have sought for it in vain, and, perhaps, by the "*Bervico* in Scotia," North-Berwick may be intended.

121. TRIGLOCHIN.

1. *T. palustre*, capsule nearly linear, of 3 cells, tapering at the base; root fibrous. *Marsh Arrow-grass.*

Hab. Bogs and marshy places. July, Aug. 2/

2. *T. maritimum*, capsule ovate, of 6 cells. *Sea Arrow-grass.*

Hab. Abundant on marshy spots on all our coasts, and at the sides of the river within the influence of the tide.
May, August. 2/

Cattle and sheep are fond of the herbage of these plants, which are probably very salutary to them from the salt they contain.

III. POLYGYNIA.

122. ALISMA.

1. *A. plantago*, leaves ovate, acute; capsules obtusely triangular; flower-stalk naked, 2 or 3 feet high, paniced with whorled compound bracteated branches; flowers pale purple. *Great Water-plaintain.*

Hab. Ponds and ditches common. July. 7/

Of established reputation in America as a specific for the bite of the rattlesnake. In the north of Europe has for some ages been a popular remedy for hydrophobia; and we are told, that it still retains its popular sway and reputation over a great part of the Russian empire; and that, in the government of Isola, it has never failed of effecting a cure for the last twenty-five years. The preparation is simple: the root is reduced to a powder, and the powder is to be eaten by being spread over bread and butter. Two or three doses are said to be sufficient in the worst cases; and will be found to cure mad dogs themselves. *Dr Good.*—This also is vanity!

2. *A. ranunculoides*, leaves linear-lanceolate; capsules angular, acute, numerous, in a globular head; stem none; flower-stalks from 3 to 10 inches high, bearing 1 or 2 whorls of light purple flowers. *Lesser Water-plaintain.*

Hab. Bogs and ditches. In the ditch at the foot of St Abb's Head, Rev. A. Baird. Holy Island Lough; and in the pond above Spindlestone. Aug. 7/

CLASS VIII.

OCTANDRIA.

“ Yet happier, in my judgment,
 The wandering Herbalist, who, clear alike
 From vain, and, that worse evil, vexing thoughts,
 Casts on these uncouth forms a slight regard
 Of transitory interest, and peeps round
 For some rare floweret of the hills, or plant
 Of craggy fountain; what he hopes for wins,
 Or learns, at least, that 'tis not to be won :
 Then, keen and eager, as a fine nos'd hound
 By soul-engrossing instinct driven along
 Through wood or open field, the harmless man
 Departs, intent upon his onward quest !
 No floweret blooms
 Throughout the lofty range of these rough hills,
 Or in the woods, that could from him conceal
 Its birth-place.” WORDSWORTH.

I. MONOGYNIA.

* *Flowers complete.*

123. *EPILOBIUM.* *Petals* 4; *calyx* 4-cleft, superior; *capsule* of 4 cells; *seeds* bearded.
124. *VACCINIUM.* *Corolla* of 1 petal; *calyx* 4-cleft; *berry* inferior.
126. *ERICA.* *Corolla* of 1 petal; *calyx* of 4 leaves; *capsule* superior, partitions simple, from the centre of each valve.

125. *CALLUNA*. *Corolla* of 1 petal; *calyx* double, each of 4 leaves; *capsule* superior, partitions from the column alternate with the valves.

* * *Flowers apetalous.*

127. *DAPHNE*. *Calyx* coloured, 4-cleft, inferior; *berry* with 1 seed.

II. TRIGYNIA.

128. *POLYGONUM*. *Calyx* coloured, in several deep segments, inferior; *corolla* 0; *seed* 1, naked.

I. MONOGYNIA.

123. *EPILOBIUM*.

* *Flowers irregular.*

1. *E. angustifolium*, leaves scattered, linear-lanceolate, veiny, smooth; flowers crimson, in long terminal clusters; stamens declining. *French Willow*.

Hab. "By a rocky rivulet above Langley-ford, near Cheviot," Winch. "In a very deep and savage glen about one mile south of Fastcastle," Rev. A. Baird. Common in gardens. July, Aug. 74

* * *Flowers regular; stigma deeply 4-cleft.*

2. *E. hirsutum*, root creeping; stem copiously branched, downy; leaves half-clasping the stem, ovate-lanceolate, hairy; flowers corymbose, large, rose-coloured. *Great Hairy Willow-herb*.

Hab. Ditches, sides of ponds and rivers common. July. 74

3. *E. parviflorum*, root fibrous; stem nearly simple, woolly; leaves sessile, lanceolate, downy; flowers in long leafy clusters, small. *Small-flowered Willow-herb*.

Hab. Watery places frequent. July. 74

4. *E. montanum*, stem round, smooth or minutely downy; leaves stalked, ovate, toothed, broad and smooth. *Broad-leaved Willow-herb*.

Hab. In stony places, and under hedges frequent. July.

℥

* * *Flowers regular; stigma undivided.*

5. *E. tetragonum*, stem erect, roundish with 4 angular ribs; leaves lanceolate, sessile, minutely toothed; herb nearly or quite smooth. *Square stalked Willow-herb*.

Hab. Watery marshy places. In the vale below Langleyford. July. ℥

6. *E. palustre*, stem erect, round; leaves sessile, linear-lanceolate, slightly toothed; herb nearly or quite smooth. *Marsh Willow-herb*.

Hab. Bogs frequent. July. ℥

7. *E. alsinifolium*, root creeping; stem decumbent, obtusely quadrangular; leaves stalked, ovate, acute, toothed. *Chickweed-leaved Willow-herb*.

Hab. In rivulets on the sides of the Cheviot Hills, as mentioned by Ray; Winch. July. ℥

“In winter it is not deciduous, but forms widely spreading matted tufts of small leaves, among which fibrous roots shoot out, as in proliferous plants. The flower-stems are partially decumbent, cylindrical, at first simple, afterwards much branched, and furnished with numerous elliptical, slightly toothed soft leaves. The flowers are few, and the style undivided.” WINCH, Guide ii. pref. v.

124. VACCINIUM.

1. *V. myrtillus*, stem acutely angular; leaves ovate, serrated, membranous, smooth, deciduous; stalks solitary, single-flowered; flowers drooping, reddish; calyx wavy, nearly entire. *Blaeberry*.

Hab. Heaths and woods. May. ℥

The bluish-black berries are said by SMITH to be neither agreeable nor wholesome, an opinion contradicted by our own experience and that of others. They are good plucked from the bush, better when eaten with cream in

the manner of strawberries; and they make tolerable tarts and jellies.

2. *V. vitis idæa*, clusters terminal, drooping, with ovate concave bractæas longer than the flower-stalks; leaves obovate, dotted beneath, revolute, minutely toothed; corolla bell-shaped, flesh-coloured. *Cow-berry*.

Hab. Higher parts of Cheviot, Winch. Jūne. h

The berries are deep red, astringent and acid, with much bitterness, which they lose by immersion, for some hours, in water before they are made into pies, rob or jelly. In the latter state this fruit is excellent for colds and sore throats; as well as for eating with venison, or other roast meat, as is practised generally in Sweden.—SM.

3. *V. oxycoccus*, stems creeping, thread-shaped, smooth; leaves ovate, entire, smooth, revolute, acute; flowers terminal, bright rose-colour, drooping; corolla deeply 4-cleft. *Cranberry*.

Hab. Peat-bogs amongst moss. "Moors between Belford and Wooler plentiful," Thomp. Haiden Dean; bog below Shoreswood Hall, Dr Thompson. Jūne. h

The berries are spotted in an early state, but become deep red in maturity. At Longtown, on the borders of Cumberland, they are made so considerable an article of commerce, that, at the season when they are ripe, not less than L. 20 or L. 30 worth are sold by the poor people, each market day, for five or six weeks together, which are afterwards dispersed over different parts of the kingdom, for making the well-known cranberry tarts. LIGHTFOOT.

125. CALLUNA.

1. *C. vulgaris*, stems bushy; leaves small, opposite, imbricated, ever-green; flowers drooping, in longish unilateral clusters. *Common Ling*.

Hab. The principal covering of our moors, and not uncommon on the sea-coast. The flowers are commonly rose-coloured, but a variety with them white is not rare. July, Aug. h

Ling, or Heather, is extensively used for thatching cottages and making besoms; and the Highlanders frequently make their beds with it, laying the roots downwards, and

the top upwards. "In this manner," says BUCHANAN, "they form a bed so pleasant, that it may vie in softness with the finest down, while in salubrity it far exceeds it; for heath, naturally possessing the power of absorption, drinks up the superfluous moisture, and restores strength to the fatigued nerves, so that those who lie down languid and weary in the evening, arise in the morning vigorous and sprightly."

126. ERICA.

1. *E. tetralix*, leaves fringed, four in a whorl; flowers in round tufts; corolla ovate; style nearly concealed; anthers horned. *Cross-leaved Heath*.

Hab. Boggy places on moors. July, Aug. h

2. *E. cinerea*, leaves three in a whorl, smooth; flowers in rather long whorled clusters; corolla ovate; style a little prominent; anthers crested; stigma capitate. *Fine-leaved Heath*.

Hab. Dry heaths abundant. July, Aug. h

"In the deserts and moors of this realm," says BOETHIUS, "grows an herb named Heather, very nutritive to beasts, birds, and especially to bees. In the month of June it produces a flower of purple hue, as sweet as honey. Of this flower the Picts made a delicious and wholesome liquor. The manner of making it has perished with the extermination of the Picts, as they never showed the craft of making it, except to their own blood."

"Sweet, modest flower, in lonely deserts dun,
Retiring still for converse with the sun,
Whose sweets invite the soaring lark to stoop,
And from thy cells the honied dew-bells scoop!
Though unobtrusive all thy beauties shine,
Yet boast, thou rival of the purpling vine!
For once thy mantling juice was seen to laugh
In pearly cups, which monarchs loved to quaff;
And frequent wake the wild inspired lay,
On Teviot's hills, beneath the Pictish sway."

LEYDEN.

127. DAPHNE.

1. *D. laureola*, clusters axillary, simple, each of about 5 yellowish-green drooping flowers, shorter than the smooth, obovate-lanceolate, evergreen leaves; calyx obtuse. *Spurge-laurel*.

Hab. Banks of the Eye above Netherbyres, quite wild,
Rev. A. Baird. Common in shrubberies. March. h

II. TRIGYNIA.

128. POLYGONUM.

* *Styles usually but 2.*

1. *P. amphibium*, leaves stalked, ovate-lanceolate, slightly heart-shaped at the base; flowers rose-coloured, in ovate dense terminal spikes; stamens 5; styles united half way up. *Amphibious Persicaria*.

(1) *aquaticum*, leaves floating, broadly lanceolate, smooth.

(2) *terrestre*, nearly erect; leaves narrow lanceolate, rough with short rigid appressed hairs.

Hab. (1) Ponds, ditches and slow streams. (2) Sides of ditches, and in moist corn fields. July, Aug. 7

2. *P. persicaria*, stem erect; leaves lanceolate, often spotted; stipulas fringed; flowers rose-coloured, in dense ovate-oblong erect spikes, on smooth stalks; stamens 6; styles united half way up. *Spotted Persicaria*.

Hab. Moist ground and waste places, common. Aug. ☉

3. *P. lapathifolium*, stem spreading; leaves ovate-lanceolate, sprinkled at the back with glandular dots; stipulas beardless; flowers greenish-white, in oblong erect spikes on rough stalks; stamens 6; styles distinct. *Pale-flowered Persicaria*.

Hab. Road sides and cultivated grounds, rather rare.
Aug. ☉

4. *P. hydropiper*, stem erect; leaves lanceolate, wavy, without spots; clusters lax, interrupted, drooping; stamens 6; styles united half way up. *Biting Persicaria*.

Hab. Ditches and watery places, frequent. Sept. ☉

* * *Styles 3.*

5. *P. aviculare*, stem procumbent, herbaceous; leaves elliptic-lanceolate, rough-edged; ribs of the stipulas distant; flowers axillary, 2 or 3 together, small. *Common Knot-grass*.

Hab. Cultivated fields, &c. very common. April—Oct.



6. *P. convolvulus*, stem twining, angular; leaves heart-arrow-shaped; segments of the calyx bluntly keeled. *Climbing Buckwheat*.

Hab. Cultivated fields common. June—Sept. ☉

CLASS X.

DECANDRIA.

“ Those who think nothing useful which does not yield some palpable and direct advantage, have, indeed, scornfully rejected such inquiries as frivolous and useless. But this disdain has not repressed such discussions ; and it is fortunate that it has not. Amusement is itself an advantage. The vigour which the understanding derives from exercise on every subject, is a great advantage.”—EDIN. REVIEW.

I. MONOGYNIA.

129. *PYROLA*. *Petals* 5 ; *anthers* of 2 cells, with 2 pores.

II. DIGYNIA.

132. *SCLERANTHUS*. *Corolla* 0 ; *calyx* of 1 leaf ; *seeds* 2.
130. *CHRYSOSPLENIUM*. *Corolla* 0 ; *calyx* coloured ; *capsule* with 2 beaks ; *seeds* numerous.
131. *SAXIFRAGA*. *Petals* 5 ; *calyx* in 5 deep segments ; *capsule* with 2 beaks ; *seeds* numerous.
133. *DIANTHUS*. *Petals* 5 ; *calyx* tubular, of 1 leaf, with scales at the base ; *capsule* oblong.

III. TRIGYNIA.

136. ARENARIA. *Capsule* of 1 cell; *petals* undivided, spreading.
135. STELLARIA. *Capsule* of 1 cell; *petals* deeply cloven, spreading.
134. SILENE. *Capsule* of 3 incomplete cells; *petals* with claws, limb cloven; *calyx* of 1 leaf.

IV. PENTAGYNIA.

137. SEDUM. *Capsules* 5, each with a scale at the base; *corolla* of 5 petals.
138. OXALIS. *Capsule* of 5 cells, angular; *seeds* 2, tunicated; *petals* connected at the base.
139. LYCHNIS. *Capsule* of 5 cells, or of 1, with many seeds; *calyx* tubular, membranous.
140. AGROSTEMMA. *Capsule* of 1 cell; *calyx* tubular, coriaceous.
141. CERASTIUM. *Capsule* of 1 cell; *calyx* of 5 leaves; *petals* cloven.
142. SPERGULA. *Capsule* of 1 cell; *calyx* of 5 leaves; *petals* undivided.

I. MONOGYNIA.

129. PYROLA.

1. *P. rotundifolia*, cluster many-flowered; *calyx* as long as the stamens; stamens ascending; style twice as long, declining and recurved. *Round-leaved Winter-green*.

Hab. In the Dean below Allerton Mill, plentiful, about midway between the mill and the lime road. July, Aug. 74

Root creeping. Leaves roundish, smooth, the margins set round with callous points at the termination of the veins, on long triangular stalks, which are slightly bordered. Flower-stalk a foot high, smooth, triangular, twisted, bearing 2 or 3 brown membranous scales. Flowers white, drooping, very beautiful, on short recurved stalks, each with a membranous bractea, sometimes shorter, and sometimes as long as itself. Stamens all turned upwards, and crowded together, with tubular anthers, at first white, but soon becoming of an uniform orange-yellow. Style twice as long as the stamens, curved like letter *f*, pink, tipped with darker red.

2. *P. media*, stamens regularly inflexed; style twice as long, deflexed; cluster of many pendulous flowers; calyx shorter than the stamens. *Intermediate Winter-green.*

Hab. Deans. Ancroft Dean, Mr J. Manners. Haiden-Dean; Longridge Dean, sparingly. July, Aug. ʒ

Rather less than the preceding, from which the student will readily distinguish it by attention to the specific characters.

II. DIGYNIA.

130. CHRYSOSPLENIUM.

1. *C. oppositifolium*, stem angular, succulent; leaves opposite, roundish-heart-shaped; flowers small, yellow, corymbose, terminal. *Common Golden-saxifrage.*

Hab. Watery shady places frequent. Sea-banks beyond the Sandy Beds, Thomp. Ord Mill, &c. May. ʒ

131. SAXIFRAGA.

1. *S. stellaris*, leaves elliptic-wedge-shaped, coarsely serrated, tapering and entire at the base; panicle corymbose, of few flowers, white with 2 yellow spots at the base of each petal; calyx reflexed, inferior. *Starry Saxifrage.*

Hab. In bogs, and by the sides of rivulets on and about Cheviot, plentiful. June, July. ʒ

2. *S. granulata*, root granulated; stem paniced, erect, leafy; leaves kidney-shaped, lobed; flowers large, white; calyx spreading; germen half-inferior; stigmas downy. *Meadow Saxifrage*.

Hab. Banks on a gravelly or sandy soil, not uncommon. Wooler-Haughhead, Winch. Alderson's Dean, and sea-banks near Marshall-meadows; Tweed banks between Yarrowhaugh and Ord Mill; Heugh, Holy Island; Chapel-hill, Belford, Thomp. In the wood above the Union Bridge. May. ♀

In conformity to the doctrine of Signatures, which attributes to any substance having a semblance to any organ of the body, sovereign virtues in removing the diseases of that organ, this plant was pronounced very useful in calculous complaints, because the roots somewhat resemble small gravel-stones. And because it is "governed by the moon," its credit remained undiminished with the astrologers, or those herbalists who imagined that the stars

—"shed down

Their stellar virtue on all plants that grow
On earth, made hereby apter to receive
Perfection from the sun's more potent ray."

132. SCLERANTHUS.

1. *S. annuus*, stems spreading, branched dichotomously; leaves linear, opposite; flowers small, green, in axillary and terminal nearly sessile clusters; calyx of the fruit with spreading taper-acute segments. *Annual Knavel*.

Hab. Dry sandy fields, and on walls. July. ☉

133. DIANTHUS.

1. *D. deltoides*, leaves linear-lanceolate, somewhat downy; flowers solitary, rose-coloured with a deeper circle in the middle; scales of the calyx ovate-lanceolate, acute, seldom more than 2; petals notched, smooth. *Maiden Pink*.

Hab. Dry gravelly banks. Hedge banks between Wooler and Earl, Winch. Chapel-hill, Belford; and craigs by Craig-mill, Thomp. Frequent in the vicinity of Wooler. July—Oct. ♀

III. TRIGYNIA.

134. SILENE.

1. *S. inflata*, stem erect, forked; leaves ovate, acute; flowers copiously paniced, drooping, white; petals cloven half way down, mostly without scales; calyx smooth, inflated, reticulated.

Bladder Campion.

Hab. Corn fields, by hedges and road sides. July. ½

The plant is in general very smooth; but a variety, densely covered with short hairs, is occasionally to be found in this neighbourhood. The leaves boiled have something of the flavour of pease, and proved of great use to the inhabitants of the Island of Minorca, in the year 1685, when a swarm of locusts had destroyed the harvest. **WITHERING.** It has been recommended for cultivation by **BRYANT**, who observes, that our kitchen-gardens scarcely afford a better flavoured vegetable than the young shoots when boiled. They ought to be gathered when not above two inches long.

2. *S. maritima*, stem recumbent; leaves lanceolate; flowers slightly paniced or solitary, terminal, white; petals cloven, each with a cloven acute scale; calyx smooth, inflated, reticulated.

Sea Campion.

Hab. Sea coast common. Aug., Sept. ½

No observation of our own leads us to believe this to be a variety of the preceding.

135. STELLARIA.

1. *S. media*, stems procumbent with a hairy alternate line on one side; leaves ovate, single-ribbed; stamens from 5 to 10.
Common Chickweed.

Hab. Waste and cultivated grounds. March—Nov. ☉

2. *S. holostea*, stem nearly erect, rigid; leaves lanceolate, finely serrated; flowers large, white; petals inversely heart-shaped, twice as long as the ribless calyx. *Greater Stitchwort.*

Hab. Woods, deans and hedge banks common. May. ½

3. *S. graminea*, stem nearly erect; leaves linear-lanceolate, entire; flowers, small, white, in a terminal spreading panicle, their petals nearly as long as the 3-ribbed calyx. *Lesser Stitchwort.*

Hab. Heathy pastures and bushy places, common. May. 7/

3. *S. glauca*, stems nearly erect, smooth; leaves linear-lanceolate, entire, glaucous; flowers white, on erect partly scattered stalks, their petals much longer than the 3-ribbed calyx. *Glaucous Stitchwort.*

Hab. Wet marshy places, rare. Side of the pond above Spindlestone. June, July. 7/

5. *S. uliginosa*, stem weak; leaves elliptic-lanceolate, entire, with a callous tip; flowers small, white, irregularly panicked, lateral or terminal, their petals shorter than the calyx. *Bog Stitchwort.*

Hab. Ditches and watery spots frequent. June. ☉

136. ARENARIA.

* *Stipulas none.*

1. *A. peploides*, herb smooth, succulent; stem much branched; leaves ovate, acute, fleshy; flowers in the axils of the upper leaves, nearly sessile, small, white; calyx obtuse, without ribs. *Sandwort.*

Hab. Sandy sea-coast. Lamberton Shields; Spittal sands and coast to the southward, Thomp. June, July. 7/

2. *A. trinervis*, stems weak, branching, downy; leaves ovate, acute, stalked, 3, or rarely 5-ribbed; flowers small, white; calyx obscurely 3-ribbed, with a rough keel. *Plantain-leaved Sandwort.*

Hab. Shady bushy places. On the wooded part of Spindlestone Hills. May, June. ☉

It is surely an error to describe this plant as having no bracteas. See SMITH's Eng. Fl. ii. 307.

3. *A. serpyllifolia*, stem much branched, rough, spreading; leaves small, ovate, nearly sessile, rough; flowers small, white; calyx hairy, three outermost of its leaves 5-ribbed. *Thyme-leaved Sandwort*.

Hab. On walls and sandy ground, common. July. ☉

4. *A. verna*, tufted; stem paniced; leaves awl-shaped, bluntish, smooth; flowers white, the petals longer than the 3-ribbed calyx. *Vernal Sandwort*.

Hab. On St Abb's-head plentiful; and in a deep glen about a mile south of Fastcastle, Rev. A. Baird. May—Aug. ʒ

* * *Stipulas membranous.*

5. *A. rubra*, stems prostrate; leaves linear, plane, somewhat fleshy, tipped with a minute bristle; stipulas sheathing; flowers purplish red; seeds compressed, angular, roughish. *Purple Sandwort*.

Hab. Sandy fields, frequent. July, Aug. ☉

6. *A. marina*, stems prostrate; leaves semicylindrical, fleshy, pointless; stipulas sheathing; flowers purplish-red; seeds compressed, bordered, smooth. *Sea Sandwort*.

Hab. Sea-coast in marshy places. Sides of the Tweed above the bridge, plentiful, Thomp. July. ☉

IV. PENTAGYNIA.

137. SEDUM.

* *Leaves flat.*

1. *S. Telephium*, stem erect; leaves flattish, serrated; flowers purple, in a terminal leafy corymb. *Orpine*.

Hab. Borders of fields near the sea, a mile north of Eyemouth, sparingly, Rev. A. Baird. Aug. Sept. ʒ

* * *Leaves tumid or somewhat cylindrical.*

2. *S. anglicum*, stems tufted, much branched, 2 or 3 inches high; leaves ovate, thick, mostly alternate, spurred at the base; cyme of 2 smooth branches; flowers white, speckled with red. *English Stonecrop.*

Hab. Heugh, Holy Island, and about the Castle, Thomp.
July. ☉

This species is said to be annual, but Mr NEILL finds it will endure for two years, though no more, in a flower-pot.

3. *S. acre*, stems tufted, branched; leaves alternate, nearly ovate, thick, tumid, spurred at the base; cyme of 3 smooth branches, leafy; flowers golden yellow. *Biting Stonecrop.*

Hab. On walls and rocks, common. June. ♀

4. *S. villosum*, pubescent, viscid; stem erect, spotted with red; leaves alternate, linear, flattened; flowers corymbose, rose-coloured. *Hairy Stonecrop.*

Hab. Bogs and moist rocks. By rivulets (and in bogs) at the foot of Cheviot, Winch. Basaltic heights between Belford and Bamborough, Thomp. June. ♀

5. *S. reflexum*, leaves awl-shaped, scattered, spurred at the base, the lowermost recurved; flowers cymose, yellow; segments of the calyx ovate. *Yellow Stonecrop.*

Hab. On walls rare. On a dike near Kyles Manse; and at Easington. July. ♀

The tenacity with which this species retains life is illustrated by the following fact. I pressed strongly between dry papers a specimen without radicles, and the flowers of which were not in the least expanded. The papers were changed every three or four days; but at the end of as many weeks, so far was life from being extinct, that it had protruded many white radicle fibres from one to two inches long, and the flowers had fully expanded themselves.

138. OXALIS.

1. *O. Acetosella*, root of many scaly joints; leaves ternate, inversely heart-shaped, hairy; stalks radical, single-flowered;

flower white, streaked; stamens all simple. *Common Wood-sorrel.*

Hab. Woods and deans, common. April, May. ½

The leaves of this pretty unobtrusive flower droop at night, and close against rain. They are powerfully and most agreeably acid, making a refreshing and wholesome conserve with fine sugar, its flavour resembling green tea. Bottled with milk they make an agreeable whey, which may be used in inflammatory diseases, in which vegetable acids are beneficial. They also afford the "essential salt of lemons," used to take iron-moulds out of linen.

139. LYCHNIS.

1. *L. Flos-Cuculi*, stem quadrangular, rough with deflexed bristles; leaves lanceolate; flowers rose-coloured, loosely panicked; petals in four linear segments; capsule roundish, of one cell. *Meadow Lychnis.*

Hab. Moist meadows, frequent. June. ½

2. *L. diurna*, stem round, pubescent; leaves ovate, acute; flowers in a terminal many-forked panicle, rose-coloured, dioecious; the petals cloven, crowned with four teeth; capsule one-celled, roundish. *Red Campion.*—(*L. dioica*, α. SMITH.)

Hab. Very abundant on our sea-banks, and frequent in bushy deans, where it proves highly ornamental. May, June. ½

3. *L. vespertina*, stem round, pubescent; leaves ovate-lanceolate; flowers in a terminal forked panicle, white; capsule one-celled, conical. *White Campion.*—(*L. dioica*, β. SMITH.)

Hab. Hedge sides and cultivated fields, common. July—Oct. ½

It may be difficult, or impossible, to find a technical specific character between this and the preceding; but I would rather consider this a proof of the occasional non-existence of *such* distinctive characters, than believe the plants to be merely varieties. The one flowers from four to six weeks earlier than the other; they affect different localities, and are never found intermixed; they are not altered by cultivation; and their general habit is not alike, the red being a stouter and fuller flowered plant, its blossoms ex-

panding during the day, and at all times scentless,—while the white opens freely in the evening only, and is then sweet-scented.

140. AGROSTEMMA.

1. *A. Githago*, hairy; stem erect; leaves linear-lanceolate; calyx-teeth rising above the purple corolla; petals undivided, without teeth. *Corn Cockle*.

Hab. Corn-fields. June, July. ☉

“What hurt it doth among corne, the spoyle vnto bread, as well in colour, taste, and vnwholesomnes, is better known than desired.”

141. CERASTIUM.

1. *C. vulgatum*, hairy, viscid, tufted; leaves ovate; petals as long as the calyx; flowers longer than their stalks, subcapitate, white. *Broad-leaved Mouse-ear Chickweed*.

Hab. Road-sides and waste ground. “Bed of Wooler Water; dikes about Earl,” Thomp. Road-sides between Blackhouse and Buncle, Berwickshire, plentiful. Sides of the road leading through the plantations near Blackadder. It seems a rare plant in this neighbourhood. May—Sept. ☉

2. *C. viscosum*, hairy, viscid, recumbent; leaves lanceolate-oblong; flowers white, somewhat paniced, shorter than their stalks. *Narrow-leaved Mouse-ear Chickweed*.

Hab. Fields and road-sides very common. May, Sept. ♀

3. *C. semidecandrum*, hairy and viscid, suberect; leaves ovate-oblong; flowers somewhat paniced, shorter than their stalks; stamens 5; petals slightly cloven. *Little Mouse-ear Chickweed*.

Hab. On walls and waste ground, very common. March, April. ☉

4. *C. tetrandrum*, hairy and somewhat viscid; flowers 4-cleft, with 4 stamens; petals inversely heart-shaped, shorter than the taper-pointed calyx, which is nearly as long as the capsule. *Four-cleft Mouse-ear Chickweed*.

Hab. Sandy sea-coast. On the Links “at Bamborough,” and Holy Island, Winch. Spittal Links, and southward. May. ☉

5. *C. arvense*, stems recumbent and matted at the base; leaves linear-lanceolate, bluntish, fringed at the base; flowers large, white; petals twice the length of the calyx; capsule shorter. *Field Chickweed*.

Hab. Dry gravelly banks, borders of fields, and road-sides, frequent. Near King's Mount Bastion; Castle-banks, Thomp. Spittal and Scrammerston Links, &c. May, Aug. 7

This species is common on all the Border between this and Kelso, though it appears to be rare in other districts of Scotland.

142. SPERGULA.

1. *S. arvensis*, leaves whorled, linear; flowers white, in a loose panicle, their stalks reflexed when in fruit. *Corn Spurrey*.

Hab. Sandy corn-fields, common. June, July. ☉

GERARDE mentions that the Spurrey is sown in Brabant, Holland and Flanders, "of purpose to fatten cattel, and to cause them to give much milke;" and it would seem the practice is still continued. In Norway, in times of scarcity, the seeds are ground and baked along with a small proportion of corn. The bread is blackish, but not bad.

The flowers are very sensible to atmospheric changes. We have seen a field, whitened with its numerous blossoms, have its appearance quite changed by the petals closing on a black cloud passing over, and discharging a few drops of rain.—The variety with five stamens is not rare.

2. *S. nodosa*, stems numerous, slender, spreading, 3—6 inches long, beset with numerous pairs of short, smooth, awl-shaped leaves, accompanied by axillary tufts of smaller ones; flowers large, white, few together, on simple stalks towards the top of each stem. *Knotted Spurrey*.

Hab. Moist sandy or turfy ground, common in this neighbourhood. Links at Bamborough and Holy Island, Winch. Boggy field west of the Steps-of-Grace Farm-house; Goswick Links, Thomp. Yarrowhaugh; and abundant on all our moors. July, Aug. 7

3. *S. subulata*, leaves opposite, awl-shaped, bristle-pointed, fringed; flower-stalks solitary, very long, each bearing a small flower, the white petals as long as the calyx. *Awl-shaped Spurrey*.

Hab. Dry pastures and barren heaths. Amongst the craigs at Easington, and at Spindlestone, plentiful. Coldingham Moor. July, Aug. 7/

This species very much resembles *Sagina procumbens*, of which LINNÆUS considered it a variety; and we have gathered specimens of the *Sagina* in which some of the flowers had a calyx of five segments, and a capsule of five cells. SMITH says he never found the marginal hairs on the leaves of *S. subulata* wanting, and that the flower-stalks are always more or less glandular and viscid; but we have gathered *wild* plants perfectly smooth in every part. See also HOOKER's Fl. Scot. i. 145.

CLASS XI.

DODECANDRIA.

“ Lucy loved all that grew upon the ground,
And loveliness in all things living found;
The gilded fly, the fern upon the wall,
Were Nature's works, and admirable all;
Pleased with indulgence of so cheap a kind,
Its cheapness never discomposed her mind.”

CRABBE.

I. MONOGYNIA.

143. *LYTHRUM.* *Petals* 6; *calyx* 12-cleft, inferior.

II. DIGYNIA.

144. *AGRIMONIA.* *Petals* 5, borne by the calyx; *seeds* in the bottom of the hardened calyx.

III. TRIGYNIA.

145. *RESEDA.* *Petals* in many segments; *capsule* of 1 cell, gaping.

IV. DODECAGYNIA.

146. *SEMPERVIVUM.* *Petals* 12; *calyx* in 12 deep segments; *capsules* 12.

I. MONOGYNIA.

143. LYTHRUM.

1. *L. salicaria*, stem square, 2 or 3 feet high; leaves opposite, lanceolate, heart-shaped at the base; flowers in whorled leafy spikes, purple; stamens 12. *Purple Loosestrife*.

Hab. Rough bogs and marshy places. Haiden and Allerton Mill deans; Tweed banks above Norham, &c. July, Aug. ♀

II. DIGYNIA.

144. AGRIMONIA.

1. *A. eupatoria*, hairy, 2 feet high; stem-leaves pinnate, leaflets elliptic-oblong, terminal one stalked; calyx encompassed with bristles; flowers numerous, yellow, in an elongated tapering spike. *Common Agrimony*.

Hab. Borders of fields, and on dry banks, frequent. June, July. ♀

The astringent and bitter qualities of this plant render it mildly tonic and stimulant; but it is rather a popular than a classical medicine, and makes the principal and most efficacious part of some empirical herb-teas.—*Eng. Bot.*

III. TRIGYNIA.

145. RESEDA.

1. *R. luteola*, leaves lanceolate, undivided; calyx in four segments; flowers yellowish, numerous, in long terminal clusters. *Dyer's Rocket*.

Hab. Waste grounds, and dry gravelly pastures, common. July. ☉

The dried stems yield, by decoction, a yellow colour, and are much used in dyeing wool, silk, and cotton.

IV. DODECAGYNIA.

146. SEMPERVIVUM.

1. *S. tectorum*, leaves fringed; offsets spreading; edges of the petals hairy, entire. *Common Houseleek*.

Hab. Cottage roofs, frequent. July. 74

“It is common in the North to plant the herb Houseleek upon the tops of cottage-houses. The learned author of the ‘Vulgar Errors’ informs us, that it was an ancient superstition, and the herb was planted on the tops of houses as a defensive against lightning and thunder.”—*BRANDE’S Pop. Antiq.* p. 241.

CLASS XII.

ICOSANDRIA.

—“ He that enlarges his curiosity after the works of Nature; demonstrably multiplies the inlets to happiness ; and, therefore, the younger part of my readers, to whom I dedicate this vernal speculation, must excuse me for calling upon them, to make use at once of the spring of the year, and the spring of life, to acquire, while their minds may be yet impressed with new images, a love of innocent pleasures, and an ardour for useful knowledge; and to remember, that a blighted spring makes a barren year, and that the vernal flowers, however beautiful and gay, are only intended by Nature as preparatives to autumnal fruits.”—DR JOHNSON.

I. MONOGYNIA.

147. PRUNUS. *Calyx* inferior, 5-cleft ; *petals* 5 ; *nut* of the *drupa* with slightly prominent seams.

II. PENTAGYNIA.

148. MESPILUS. *Calyx* superior, 5-cleft ; *petals* 5 ; *apple* with 2-5 bony single-valved capsules ; *seeds* 2.
149. PYRUS. *Calyx* superior, 5-cleft ; *petals* 5 ; *apple* with 2-5 membranous 2-valved capsules ; *seeds* 2.
150. SPIRÆA. *Calyx* inferior, 5-cleft ; *petals* 5 ; *capsules* of 2 membranous valves ; *seeds* numerous.

III. POLYGYNIA.

151. *ROSA*. *Calyx* 5-cleft; *tube* finally pulpy, lined with hairs, and with numerous bristly *seeds*.
152. *RUBUS*. *Calyx* 5-cleft; *berry* superior, compound, deciduous; *receptacle* spongy, permanent.
155. *TORMENTILLA*. *Calyx* 8-cleft; *petals* 4; *seeds* naked, beardless; *receptacle* dry, obsolete.
156. *GEUM*. *Calyx* 10-cleft; *petals* 5; *seeds* each with a bent hooked tail; *receptacle* columnar.
153. *FRAGARIA*. *Calyx* 10-cleft; *seeds* naked, even, on the surface of a pulpy deciduous *receptacle*.
157. *COMARUM*. *Calyx* 10-cleft; *seeds* naked, even, on the surface of a spongy, hairy, permanent *receptacle*.
154. *POTENTILLA*. *Calyx* 10-cleft; *seeds* naked, rugged, beardless; *receptacle* dry, obsolete.

I. MONOGYNIA.

147. *PRUNUS*.

1. *P. Padus*, flowers white, in cylindrical pendulous clusters; leaves deciduous, smooth, with 2 glands on the under side at the base. *Bird Cherry*.

Hab. Woods about Houndwood and Renton Inns. In a dean about a mile south of Fastcastle. May. $\frac{1}{2}$

The leaves of this shrub, when bruised, have a disagreeable scent, resembling Rue. Birds of several kinds soon devour the black, austere and bitter fruit, which is nauseous, and probably dangerous to mankind, though LIGHT-FOOT asserts that an infusion of them in brandy is drank in Scotland.

2. *P. Cerasus*, flowers white, in nearly sessile umbels; leaves ovate-lanceolate, folded flat in the bud, somewhat downy beneath. *Wild Cherry*.

Hab. Hedges. Near Flemington. May. h

3. *P. spinosa*, flower-stalks solitary; leaves lanceolate, smooth; branches thorny at the end. *Sloe*.

Hab. Hedges and deans. April. h

The flowers appear earlier than the leaves, and are evolved in such profusion, that it would seem

“As if a flaky shower the leafless sprays
Had hung.”

The leaves are reckoned among the adulterations of tea in England; and the inspissated juice of the fruit serves to adulterate, or to make fictitious port-wine.

II. PENTAGYNIA.

148. MESPILUS.

1. *M. Oxyacantha*, thorny; leaves obtuse, variously 3-lobed, serrated, smooth; styles about 2. *Hawthorn*.

Hab. Woods. June. h

“Few of our native plants can present a more beautiful sight than a well-grown bush of Hawthorn, with its dense masses of white flowers backed by the shining dark-green leaves. Nor is it less desirable on account of its scent; though there are many individual plants perfectly destitute of it. It is excellent for fences, and bears clipping admirably. The fruit affords a supply of food to innumerable birds in a season when scarcely any thing else is to be obtained.” HOOKER.—When old, it is much infested with the grey lichen, a state in which it is very poetically described by BURNS:

“The hawthorn I will pu’, wi’ its locks o’ siller grey,
Where, like an aged man, it stands at break o’ day,
But the songster’s nest within the bush I winna tak away;
And a’ to be a posie to my ain dear May.”

149. PYRUS.

1. *P. Malus*, leaves simple, serrated, more or less elliptical flowers in a simple sessile umbel. *Crab-tree*.

Hab. Hedges, common. May. h_2

2. *P. Aucuparia*, leaves pinnate, leaflets uniform, serrated, smooth; flowers corymbose; styles about 3; fruit globular. *Roan-tree*.

Hab. Woods. At the base of Cheviot. May. h_2

“It is probable that this tree was in high esteem with the Druids; for it may to this day be observed to grow more frequently than any other in the neighbourhood of those Druidical circles of stones, so often seen in North Britain; and the superstitious still continue to retain a great veneration for it, which was undoubtedly handed down to them from early antiquity. They believe that any small part of this tree carried about them, will prove a sovereign charm against all the dire effects of enchantment or witchcraft. Their cattle also, as well as themselves, are supposed to be preserved by it from evil; for the dairy-maid will not forget to drive them to the shealings or summer pastures with a rod of the Rowan-tree, which she carefully lays up over the door of the sheal-booth, or summer-house, and drives them home again with the same.” This superstitious belief prevailed also in Northumberland, but is now probably extinct.—In the Island of Jura they use the juice of the berries as an acid for punch; and, in some places, the Highlanders distil a very good spirit from them. LIGHTFOOT.—“Ale and beer brewed with these berries, being ripe, is an incomparable drink, familiar in Wales, where this tree is reputed so sacred, that there is not a churchyard without one of them planted in it.” EVELYN.

150. SPIRÆA.

1. *S. ulmaria*, stem herbaceous; leaves interruptedly pinnate, downy beneath, the terminal leaflet largest and lobed; flowers cymose, with many styles, cream-coloured. *Meadow-sweet*.

Hab. Moist meadows and banks of rivulets. July. \mathcal{U}

III. POLYGYNIA.

151. ROSA.

* *Branches bristly. Prickles mostly slender, nearly straight.*

1. *R. spinosissima*, flower-stalks without bracteas, mostly smooth, as well as the simple calyx; fruit globose, abrupt, somewhat depressed; prickles of the stem straight, unequal, numerous, intermixed with glandular bristles; leaflets roundish, smooth, with simple serratures. *Burnet Rose.*

Hab. Sandy sea-banks, deans, and hedges, common. The only species found wild in Holy Island. June, July.

A small bushy very prickly shrub, of a dark colour, with small leaves. The flowers are white or cream-coloured; the fruit at first reddish brown, black when ripe. It is the *Cat-hip* of school-boys.

* * *Branches without bristles. Prickles nearly straight..*

2. *R. tomentosa*, fruit broadly elliptical, bristly; calyx copiously pinnate; prickles slightly curved; leaflets ovate, acute, more or less downy. *Downy-leaved Dog-Rose.*

Hab. Deans and hedges, common. June, July.

A branching bushy shrub. Branches round, often coloured on one side, prickly, but otherwise smooth. Prickles irregularly placed, more or less dilated at the base. Leaflets doubly serrated, glandular on the margins; the footstalks downy, glandular and prickly. Flowers red, paler at the base, usually two or three together, on stalks thickly beset with glandular bristles. Fruit red, bristly, capped with the permanent calyx.

3. *R. scabriuscula*, fruit roundish-ovate, bristly as well as the flowerstalks; prickles awl-shaped; leaflets doubly serrated, elliptical, hairy on both sides; divisions of the calyx permanent. *Rough-leaved Dog-Rose.* Winch, Geogr. Dist. p. 45.

Hab. Banks of the Tweed above the Union Bridge, plentiful; and occasionally in hedges. June, July.

“The buds are peculiarly handsome when sufficiently expanded to shew the bright red tints with which the outer edge of the snow-white petals are marked.” Sometimes the flowers are entirely white; and a variety with them scarcely one-half their usual size, grows abundantly at the sides of the road between Ancroft and Barmoor.—Probably a variety of *R. tomentosa*.

* * * *Branches without bristles. Prickles hooked, compressed. Styles distinct.*

4. *R. rubiginosa*, fruit obovate, bristly towards the base; calyx pinnate; prickles hooked, compressed, with smaller, straighter ones interspersed; leaflets elliptical, doubly serrated, hairy, clothed beneath with rusty-coloured glands. *Sweet Briar*.

Hab. Hedges about Scremmerston and Broomhouse, but not certainly wild. July.

5. *R. sarmentacea*, fruit broadly elliptical, naked; flower-stalks aggregate, smooth or minutely bristly; calyx strongly pinnate; prickles hooked; leaflets ovate, doubly serrated, very smooth. *Trailing Rose*.

Hab. Hedges and deans, frequent. June, July.

It will, I think, depend upon the value which may be attached to the character afforded by the *doubly* serrated leaves, whether we will consider this species distinct from *R. canina*, or not. I cannot perceive any other difference between them. Flowers pale pink.

6. *R. dumetorum*, fruit elliptical, smooth, as tall as the bractes; flower-stalks aggregate, smooth; calyx copiously pinnate, somewhat cut; prickles numerously scattered, hooked; leaflets simply serrated, hairy on both sides. *Thicket Rose*. (Eng. Fl. ii. 392.)

Hab. Deans and hedges not rare in this neighbourhood. Side of the road between New Farm and the Old Lamberton Toll. Below Lamberton Shields. On banks between Middleton and Langley Ford. June, July.

A branching shrub, 3 or 4 feet high. Branches brownish, smooth, or blistered, round, with equal hooked prickles. Two of these are generally placed at the base of each leaf, one a little below the other, and there is often a third; the base is much dilated. Leaflets 5 or 7, ovate, acute,

irregularly serrated, hairy, particularly beneath on the ribs, more sparingly on the upper surface, which is greener. The serratures are often tipped with a gland, more commonly only gangrened. Footstalks downy, with a few brownish glands intermixed, and 1 or 2 prickles on the inferior surface. Stipulas linear, pointed, smooth, fringed with hairs and numerous glands. Bracteas smooth, ovate-lanceolate, fringed like the stipulas, the outer one generally as long as the fruit, sometimes with a leaf-like point, which rises much above it. Flower-stalks smooth, rather short, generally 3 together. Tube of the calyx smooth, nearly globular, sometimes elliptical; segments of the limb spreading, downy, and glandular, 2 of them copiously pinnate. Petals light red, white at the base, obcordate, emarginate. Styles prominent, hairy. Stigmas forming a round hairy head. Fruit red, smooth, elliptical. Calyx deciduous. This seems a very distinct species, whose identity with the *R. dumetorum* of SMITH, I have been enabled to ascertain through the kindness of Mr WINCH. The *R. dumetorum* of Eng. Botany is quite a different plant.

7. *R. Forsteri*, fruit elliptical, smooth, like the aggregate flower-stalks; calyx copiously, and somewhat doubly pinnate; prickles scattered, conical, hooked; leaflets simply serrated, smooth above, ribs hairy beneath.

Hab. Ancroft dean. June, July.

Mr WINCH informs me, our plant agrees with a specimen he has from FORSTER; and it corresponds with SMITH's description. After an attentive examination of it in a growing state, I am satisfied that it cannot be kept distinct from *R. canina*.

8. *R. canina*, fruit ovate, smooth or somewhat bristly, like the aggregate flower-stalks; calyx pinnate, deciduous; prickles strongly hooked; leaflets simply serrated, pointed, quite smooth. *Common Dog-Rose.*

Hab. Hedges and thickets. June, July.

Flowers pale pink, clustered, soon out-topped by the leading shoots of the shrub. "It were to small purpose to use many words in the description thereof; for even children with great delight eat the berries thereof when they be ripe, make chaines and other pretty gewgawes of the fruit: cookes and gentlewomen make tarts, and such like

dishes for pleasure thereof, and therefore this shall suffice for the description."

152. RUBUS.

1. *R. fruticosus*, stems angular, furrowed, barren ones arched and elongated; prickles hooked; leaves pedate, of 5 stalked ovate-oblong leaflets, white and downy beneath; panicle cylindrical, twice compound; calyx reflexed, unarmed; petals delicate pink. *Common Bramble*.

Hab. Hedges and deans. July, Aug.

2. *R. glandulosus*, stems angular; branches and footstalks hairy, with glandular bristles interspersed; prickles deflexed, partly hooked; leaflets 5 or 3, downy beneath; panicle and calyx very prickly and hairy, with copious glandular bristles; petals white. *Glandular Bramble*.

Hab. Hedges not rare. July, Aug.

3. *R. idæus*, stems round, erect, smooth, with downy branches, their prickles straight and slender; leaves pinnate, of 5 or 3 ovate rather angular leaflets, very downy beneath; clusters prickly, somewhat compound; flowers pendulous, white. *Raspberry*.

Hab. Woods and deans, frequent. June.

4. *R. corylifolius*, stems round, spreading, barren ones somewhat angular; prickles scattered, straight, deflexed; leaflets 5 or 3, roundish-heart-shaped, finely hairy beneath; panicle minutely glandular, as well as the reflexed calyx; petals white. *Hazel-leaved Bramble*.

Hab. Side of the Whiteadder, between its mouth and the bridge. Sea-banks below Lamberton Shields. Also in hedges, frequent. July, Aug.

5. *R. cæsius*, stems prostrate, round, glaucous, prickly and bristly; prickles deflexed; leaflets 3, hairy beneath, lateral ones lobed externally; calyx embracing the glaucous fruit; flowers white or blush-coloured. *Dew-berry*.

Hab. Bushy places not common. Tweed banks beyond Ord-Mill, Thomp. July.

6. *R. Chamæmorus*, stem herbaceous, without prickles, simple, single-flowered; leaves simple, plaited, lobed; segments of the calyx ovate; flowers white. *Cloud-berry*.

Hab. On Cheviot, plentiful, Winch. June. ʒ

The fruit, bruised and eaten with reindeer milk, is a favourite Lapland dish. They also make a jelly of it, by boiling it with fish. Immense quantities are sent in autumn from all the north of the Gulph of Bothnia to Stockholm, where it is used for sauces, and in making vinegar. Its medicinal properties, says the celebrated Dr CLARKE, have certainly been overlooked, owing, perhaps, to its rarity in Britain, or to its not attaining the same degree of perfection as in Lapland. He was cured of a "most obstinate obstruction of the biliary duct," by eating freely of the fruit. "When eaten with sugar and cream, it is cooling and delicious, and tastes like the large American hautboy strawberries. Little did the author dream of the blessed effects he was to experience by tasting of the offering brought by these little children, who, proud of having their gifts accepted, would gladly run and gather daily a fresh supply; which was as often blended with cream and sugar, by the hands of their mother; until at last he perceived that his fever rapidly abated, his spirits and his appetite were restored;—and, when sinking under a disorder so obstinate, that it seemed to be incurable, the blessings of health were restored to him, where he had reason to believe he should have found his grave."

153. FRAGARIA.

1. *F. vesca*, calyx of the fruit reflexed; hairs of the footstalks widely spreading, those of the partial flower-stalks close-pressed, silky. *Wood Strawberry*.

Hab. Woods and hedge-banks. May, June. ʒ

154. POTENTILLA.

1. *P. anserina*, stem creeping; leaves interruptedly pinnate, serrated, silky; stalks axillary, solitary, single-flowered; flower yellow. *Silver-weed. Moss-crops*.

Hab. Moist fields and road-sides. July. ʒ

The roots taste like parsnips, and are frequently eaten by the common people in Scotland, either roasted or boiled. In the islands of Tirey and Col they are much esteemed, as

answering, in some measure, the purposes of bread, they having been known to support the inhabitants for months together, during a scarcity of other provisions.—LIGHT-FOOT.

2. *P. verna*, stems procumbent; radical leaves of 5 or 7 obovate-wedge-shaped, partly serrated, furrowed leaflets, hairy at the margins and ribs beneath; upper stipulas dilated; flowers yellow. *Spring Cinquefoil*.

Hab. Spindlestone Hills, Northumberland, plentiful. May. 24

3. *P. reptans*, stem creeping; leaflets 5, obovate, serrated; stalks axillary, single-flowered; flower yellow. *Creeping Cinquefoil*.

Hab. Road-sides and borders of fields. June-Aug. 24

4. *P. fragariastrum*, stems prostrate; leaves ternate, leaflets roundish-obovate, serrated, hairy; flowers small, white; seeds corrugated, hairy at the scar. *Strawberry-leaved Cinquefoil*.

Hab. Dry gravelly banks, frequent. April. 24

155. TORMENTILLA.

1. *T. officinalis*, stem ascending, branched; leaves almost sessile, ternate; leaflets oblong acute, deeply serrated; stipulas cut; flowers small, yellow. *Common Tormentil*.

Hab. Barren pastures and heaths. June, July. 24

The root is very astringent; and, in several northern countries, is gathered for the purpose of tanning. Indeed it is asserted that it contains a larger proportion of the tanning principle than any other wood or bark, a pound and a half of tormentil being equal to seven pounds of oak-bark. It is used medicinally.

2. *T. reptans*, stem prostrate, scarcely branched; leaves stalked, ternate; leaflets obovate, toothed; stipulas undivided; flowers rather large, yellow. *Trailing Tormentil*.

Hab. "Heathy ground, a mile north of Coldingham; Little Swinton Bogs, Berwickshire," Rev. A. Baird. June, July. 24

156. GEUM.

1. *G. urbanum*, leaves ternate, radical ones somewhat lyrate; stipulas rounded, cut; flowers nearly upright, small, yellow; styles naked. *Common Avens.*

Hab. Woods and hedges, frequent. May-Aug. 2/

Formerly in high repute for all relaxations of the bowels; and, from its astringent and tonic power, deserves to be revived. Its taste is aromatic and austere.—Dr Good.

2. *G. rivale*, radical leaves interruptedly pinnate, somewhat lyrate; stipulas ovate, acute, cut; flowers drooping, large, with a purplish-brown calyx and tawny brown petals; styles hairy above the curvature. *Water Avens.*

Hab. Sides of rivulets and ditches, and in boggy woods, common. June, July. 2/.

The variety β , considered a hybrid plant by some, but erroneously, is found in the woods at Netherbyres, according to Mr BAIRD, and has occurred to us in the immediate neighbourhood. In it the stalk supports a showy rose-like flower, consisting of numerous red striated petals, without any calyx, the segments of which have been converted into leaf-like bracteas. From the centre of this another flower, generally of the usual conformation, arises, and its stalk bears near the base 3 lacinated bracteas, very much resembling in colour and texture the true petals; but monstrosities are never constant in character, and two specimens will seldom be found to correspond precisely.

157. COMARUM.

1. *C. palustre*, downy; leaves pinnate, the lower with 7 or 5 elliptical serrated leaflets, the upper with 3; flowers dark purplish red, the petals much smaller than the calyx. *Marsh Cinquefoil.*

Hab. Spongy bogs and marshy places, frequent. Below Murton Craigs, Thomp. Haiden dean; below Shoreswood-hall, Dr Thompson. Longridge dean, &c. July. 2/

CLASS XIII.

POLYANDRIA.

“ At early morn
 Court the fresh air, explore the heaths and woods,
 And, leaving it to others to foretell,
 By calculations sage, the ebb and flow
 Of tides; and, when the moon will be eclipsed,
 Do you, for your own benefit, construct
 A calendar of flowers, plucked as they blow
 Where health abides, and cheerfulness and peace.”

I. MONOGYNIA.

* *Petals 4.*

160. PAPAVER. *Calyx* of 2 leaves; *capsule* of 1 cell, opening by pores under the *stigma*.
158. CHELIDONIUM. *Calyx* of 2 leaves; *pod* of 1 cell; *seeds* crested.
159. GLAUCIUM. *Calyx* of 2 leaves; *pod* of 2 or 3 cells; *seeds* dotted.

* * *Petals 5.*

162. CRISTUS. *Capsule* of several valves; *seeds* numerous; *calyx* of 5 permanent leaves, 2 of them smaller.

* * * *Petals numerous.*

161. NUPHAR. *Berry* coated, of many cells ; *petals* from the receptacle, furrowed and honey-bearing at the back.

II. POLYGYNIA.

164. THALICTRUM. *Calyx* 0 ; *petals* 4 or 5, imbricated ; *seeds* without any appendage.
163. ANEMONE. *Calyx* 0 ; *petals* 5-15, imbricated ; *seeds* numerous.
167. CALTHA. *Calyx* 0 ; *petals* 5, or more ; *nectary* 0 ; *follicles* 5-10.
166. TROLLIUS. *Calyx* 0 ; *petals* 5-15, deciduous ; *nectaries* flattened ; *follicles* numerous.
165. RANUNCULUS. *Calyx* of 5 leaves ; *petals* 5, or more, with *nectaries* in their claws ; *seeds* numerous, naked.

I. MONOGYNIA.

158. CHELIDONIUM.

1. *C. majus*, stem smooth, branched, with orange-coloured juice ; leaves deeply pinnatifid ; flowers umbellate, yellow. *Common Celandine.*

Hab. " Dike north of the Magdalen Field farm-house, sparingly," Thomp. Occasionally to be seen in cottage gardens. May, June. 4

159. GLAUCIUM.

1. *G. luteum*, stem smooth ; radical leaves lyrate, those of the stem clasping, wavy ; flowers large, yellow ; pod roughish with minute tubercles, a foot long. *Yellow Horned-poppy.*

Hab. Sandy sea-coast at Coldingham, Rev. A. Baird.
July, Aug. ♂

160. PAPAVER.

1. *P. argemone*, stem leafy, many-flowered ; leaves doubly pinnatifid ; calyx slightly hairy ; capsule club-shaped, ribbed, bristly. *Long rough-headed Poppy.*

Hab. Corn fields. June, July. ☉

2. *P. dubium*, stem many-flowered, hairy ; leaves doubly pinnatifid ; bristles on the flower-stalks close-pressed ; capsule smooth, oblong, angular. *Long smooth-headed Poppy.*

Hab. Cultivated grounds, occasionally. July. ☉

3. *P. Rhœas*, stem many-flowered, rough (like the flower-stalks) with spreading bristles ; leaves pinnatifid, cut ; capsule smooth, nearly globular ; stigma many-rayed. *Common Red Poppy.*

Hab. Corn fields. Abundant on Holy Island. July. ☉

161. NUPHAR.

1. *N. lutea*, calyx of 5 leaves ; border of the stigma entire ; footstalks two-edged ; lobes of the leaves meeting each other. *Yellow Water Lily.*

Hab. Coldingham Lough, Rev. A. Baird. July. 2/

“ Flowers about 2 inches wide, cupped, all over of a golden yellow, with the scent of brandy or ratifia, whence they are called Brandy-bottles in Norfolk. They perhaps communicate this flavour by infusion to the cooling liquors, or sherbets, so much used in the Levant.”—SM.

162. CISTUS.

1. *C. Helianthemum*, shrubby, procumbent, with fringed stipulas ; leaves elliptic-oblong, white, and downy beneath ; calyx-ribs bristly, its outer leaves lanceolate, fringed. *Dwarf Cistus.*

Hab. Heugh, Holy Island, Thomp. On the rocky ridge extending from Kyloe to Bamborough, most abundant. Sea-banks beyond Hudshead. Longridge dean. Banks of the Whiteadder above Edrington Mill, &c. June-Aug. 2

An elegant little shrub with yellow blossoms, which expand in sunshine only, and are of ephemeral existence. The stamens, when rudely touched, retire from the style, and lie down in a spreading form upon the petals,—an interesting example of vegetable irritability.

Mr WINCH found a single specimen of *Delphinium consolida*, in fields near the Loch on Holy Island; but, as he informs me, it may have been imported with corn, and can scarcely claim a place in our Flora.

II. POLYGYNIA.

163. ANEMONE.

1. *A. nemorosa*, stem single-flowered; leaves and involucre stalked, ternate, lobed and cut; petals 6, elliptical, white, tinged with purple on the outside; seeds pointed, without tails. *Wood Anemone*.

Hab. Woods, deans, and elevated moors, abundant. April.

℥

164. THALICTRUM.

1. *T. minus*, leaves doubly pinnate, leaflets ternate, 3-cleft, glaucous on both sides; flowers paniced, pendulous; stem zigzag; stipulas rounded. *Lesser Meadow-rue*.

Hab. Dry pastures. Tweed banks opposite Spring Gardens; Spittal Links, and banks beyond Hudshead, Thomp. Common on our coast. June, July. ℥

2. *T. majus*, leaves triply pinnate, leaflets ternate, lobed, glaucous beneath; branches of the panicle aggregate, somewhat umvellate; flowers drooping; stipulas crescent-shaped, notched. *Greater Meadow-rue*.

Hab. "Rocky and woody banks of the Eye at Netherbyres," Rev. A. Baird. June, July. ℥

3. *T. flavum*, stem erect, furrowed, leafy; leaves doubly pin-

F

nate, partly 3-lobed; panicle compound, close, corymbose; flowers and stamens erect. *Common Meadow-rue.*

Hab. Wet meadows, rare. "Porterhaugh," Thomp. Woods at Netherbyres, Rev. A. Baird. June, July. 7/

165. RANUNCULUS.

* *Leaves simple. Flowers yellow.*

1. *R. Flammula*, root fibrous; stem reclining; leaves ovate-lanceolate, bluntish, stalked; seeds smooth. *Lesser Spear-wort.*

Hab. Marshy places, common. June–Sept. 7/

The distilled water of this plant acts instantaneously as a vomit, "and, from the experience I have had of it," says Dr WITHERING, "I feel myself authorised to assert, that, in the case of poison being swallowed, or other circumstances occurring, in which it is desirable to make a patient vomit instantaneously, it is preferable to any other medicine yet known, and does not excite those painful contractions in the upper part of the stomach, which the white vitriol sometimes does, thereby defeating the intention for which it was given." Notwithstanding this recommendation from a physician, distinguished for his learning and practical skill, the remedy is altogether neglected. There be "phantasticall physitions, who, when they have found an approved medicine and perfect remedie neere home against any disease; yet, not content therewith, they will seeke for a new farther off, and by that meanes many times hurt more than they helpe."

2. *R. lingua*, root fibrous; stem erect, many-flowered; leaves lanceolate, pointed, nearly sessile, somewhat serrated; seeds smooth; flowers large. *Great Spear-wort.*

Hab. In the pond above Spindleston. July. 7/

3. *R. Ficaria*, leaves heart-shaped, angular, stalked, smooth; petals numerous, elliptic-oblong. *Pilewort.*

Hab. Moist meadows and hedge-banks. April. 7/

** *Leaves lobed or cut. Flowers yellow.*

4. *R. sceleratus*, stem erect, hollow, much branched; leaves

smooth, lower ones palmate, upper fingered; flowers small; fruit oblong; seeds very numerous, minute. *Water Crowfoot.*

Hab. Watery places, common. June–Aug. ☉

The bruised herb is said to raise a blister, leaving a sore, which is not easily healed. “Cunning beggars do vse to stampe the leaves, and lay it vnto their legs and arms, which causeth such filthy ulcers, as we daily see (among such wicked vagabonds), to move the people the more to pitie.”

5. *R. bulbosus*, root bulbous; stem upright, many-flowered; leaves cut into 3 stalked leaflets, which are deeply 3-cleft and cut; flower-stalks furrowed; calyx reflexed; seeds smooth. *Butter-cups.*

Hab. Meadows and pastures. May. ♀

6. *R. repens*, root slightly tuberous, with creeping scions; leaves compound, cut, the uppermost entire; flower-stalks furrowed; calyx spreading. *Creeping Crowfoot.*

Hab. Moist meadows and pastures. June–Aug. ♀

7. *R. acris*, stem erect, covered with close hairs; leaves in 3 deep lobed and cut segments, those of the uppermost linear and entire: flower-stalks round and even; calyx spreading. *Meadow Crowfoot.*

Hab. Meadows and pastures. June, July. ♀

8. *R. arvensis*, stem erect, much branched, many-flowered, smooth; leaves once or twice deeply 3-cleft, with linear-lanceolate segments; flowers small, pale; seeds very prickly at the sides. *Corn Crowfoot.*

Hab. Corn fields, rare in the immediate neighbourhood, but common about Paxton, Swinton, &c. and in the vicinity of Bamborough. June. ☉

The prickly seeds render this species troublesome to the reaper. It is said to be very dangerous to cattle, and they eat it greedily.

* * * *Petals white with a yellow claw.*

9. *R. hederaceus*, stem creeping; leaves roundish-kidney-sha-

ped, with 3 or 5 lobes, entire, smooth; petals small, scarcely longer than the calyx; seeds wrinkled. *Ivy Crowfoot*.

Hab. Ditches and watery places, frequent. May–Aug.
 7

10. *R. aquatilis*, stem floating, submersed; leaves in capillary segments under water, above somewhat peltate, lobed, bluntly notched; petals obovate, twice as long as the calyx. *Water Crowfoot*.

(1) *aquatilis*, all the leaves divided into long capillary segments.

(2) *circinatus*, all the leaves divided into capillary diverging segments, forming a small orbicular outline.

Hab. Ponds and still running waters. (1) In rapid streams. (2) Holy Island Loch. May, June. 7

The properties of this seem to be very different from those of the Corn Crowfoot; for we are told by Dr PULTENEY, that, in the neighbourhood of Ringwood, on the borders of the Avon, some cottagers sustain their cows and horses almost wholly by it. The cows relished it so highly, that it was unsafe to allow them more than a certain quantity, between 25 and 30 pounds each daily, but with variation, according to circumstances. The cows were not in a mean condition, and gave a sufficient quantity of good milk. Hogs also are fed with the same plant, on which they improve so well, that it is not necessary to allow them other substances, till it is proper to put them up to fatten.—*Lin. Trans.*

166. TROLLIUS.

1. *T. europæus*, petals about 15, converging into a globe; nectaries from 5 to 10, the length of the stamens. *Globe-flower*.

Hab. Moist meadows, not uncommon. Haidendean, abundant. Felkington Bog, sparingly, Dr Thompson. "Buncle Wood. Banks of the Leet at Swinton. In the marshy field near Edington Moor," Rev. A. Baird. Lamberton Moor. June. 7

The flowers are large, handsome, yellow, giving the plant a good title to its place in the garden. The country people of Westmoreland, Scotland, and Sweden, consider it a sort of festival flower, going in parties to gather it, for

the decoration of their doors and apartments, as well as their persons.—SM. It is the *Lucken-gowan* of ALLAN RAMSAY,—

“ We'll pou the daisies on the green,
The lucken-gowans frae the bog;
Between hands now and then we'll lean,
And sport upon the velvet fog.”

167. *CALTHA*.

1. *C. palustris*, smooth ; stem erect ; leaves heart-shaped, rounded, crenate ; flowers large, yellow. *Marsh Marigold*.

Hab. Marshes and boggy places. May, June. 24

The flower-buds preserved in salted vinegar, are a good substitute for capers.

CLASS XIV.

DIDYNAMIA.

“ We content ourselves with the knowledge of the tongues, and a little skill in philology, or history, perhaps, and antiquity, and neglect that which to me seems more material, I mean natural history, and the works of the creation. I do not discommend, or derogate from those other studies. I should betray mine own ignorance and weakness should I do so; I only wish they might not altogether jumble out, and exclude this. I wish that this might be brought in fashion among us; I wish men would be so equal and civil, as not to disparage, deride, and vilify those studies, which themselves skill not of, or are not conversant in; no knowledge can be more pleasant than this, none that doth so satisfy and feed the soul; in comparison whereto that of words and phrases seems to me insipid and jejune.”—RAY.

I. GYMNOSPERMIA.

* *Calyx in 5 segments, nearly regular.*

171. **GLECHOMA.** *Upper lip of the corolla cloven, the lower in 3 segments, middle segment broadest, emarginate; anthers converging crosswise in pairs.*
170. **MENTHA.** *Corolla nearly equal, 4-lobed, the broadest slightly notched; filaments spreading widely, straight.*
169. **TEUCRIUM.** *Upper lip of the corolla in 2 very deep remote lateral lobes, the stamens projecting through the cleft; lower lip 3-lobed, central lobe largest.*

168. *AJUGA*. *Upper lip* minute, abrupt, notched; *lower* one 3-lobed, the central largest, inversely heart-shaped; *stamens* exserted.
174. *BETONICA*. *Calyx* teeth spinous-tipped; *upper lip* of the *corolla* nearly flat, ascending, the *lower* 3-cleft; *tube* cylindrical, incurved; *stamens* not longer than the throat.
172. *LAMIUM*. *Calyx* teeth spinous, spreading; *upper lip* of the *corolla* vaulted, entire, *lower* 2-lobed, toothed at each side of the throat; *anthers* hairy.
173. *GALEOPSIS*. *Calyx* teeth spinous-tipped; *upper lip* of the *corolla* vaulted, serrated, *lower* in 3 unequal lobes, with a pair of hollow prominences at the base in front.
175. *STACHYS*. *Calyx* teeth spinous-pointed; *upper lip* of the *corolla* vaulted, *lower* one 3-lobed, the lateral lobes reflexed; *stamens* finally spreading outwards at each side.
176. *BALLOTA*. *Calyx* with 10 ribs and 5 teeth; *upper lip* of the *corolla* concave, notched: *lower* 3-lobed, obtuse, the central lobe largest, cloven.
177. *MARRUBIUM*. *Calyx* with 10 ribs and 10 spreading teeth; *upper lip* of the *corolla* straight, linear, cloven: *lower* in 3 deep lobes, the middle one largest and cloven.

* * *Calyx* two-lipped.

181. *SCUTELLARIA*. *Calyx*, when in fruit, closed by a dorsal lid.
180. *THYMUS*. *Calyx* closed with dense converging hairs.
178. *CLINOPodium*. *Calyx* many-ribbed; *involucrum* of numerous taper leaves under the flowers.
179. *ORIGANUM*. *Calyx* without ribs; *involucrum* of numerous dilated flat leaves, 1 to each flower, collected into a spurious *catkin*.

182. **PRUNELLA.** *Upper lip of the calyx with 3 very short acute teeth ; filaments forked, 1 of the points bearing the anther ; stigma bifid.*

II. ANGIOSPERMIA.

* *Calyx four-cleft.*

183. **BARTSIA.** *Calyx coloured ; corolla ringent, with a contracted orifice ; upper lip longest, concave, entire ; lower in 3 equal reflexed lobes ; capsule ovate, compressed, of 2 cells ; seeds angular.*
184. **RHINANTHUS.** *Calyx inflated, 4-toothed ; upper lip of the corolla compressed, lower one plane, 3-lobed ; capsule of 2 cells, obtuse, compressed ; seeds compressed, imbricated.*
186. **MELAMPYRUM.** *Upper lip of the corolla compressed, with a narrow reflexed border at each side ; lower lip in 3 nearly equal segments ; capsule oblong, 2-celled, oblique, opening on one side ; seeds in pairs, tumid, smooth.*
185. **EUPHRASIA.** *Calyx tubular, 4-toothed ; upper lip of the corolla divided ; lower one spreading, of 3 notched lobes ; anthers spinous ; capsule of 2 cells ; seeds striated.*

* * *Calyx five-cleft.*

189. **SCROPHULARIA.** *Corolla subglobose ; limb contracted, shortly 2-lipped, upper lip 2-lobed (with a small interior lobe frequently within), lower 3-lobed. Capsule of 2 cells.*
190. **DIGITALIS.** *Calyx in 5 segments ; corolla bell-shaped, inflated beneath ; stamens bent ; capsule of 2 cells.*
188. **ANTIRRHINUM.** *Calyx in 5 segments ; corolla closed with a palate, prominent or spurred at the base behind ; capsule of 2 cells, bursting unequally at the summit.*
187. **PEDICULARIS.** *Calyx inflated ; corolla ringent ; upper lip compressed, arched, the lower plane, 3-lobed ; capsule oblique, compressed, 2-celled ; seeds pointed.*

DIDYNAMIA—GYMNOSPERMIA. 133

Hab. Deans and dry banks. A little beyond Dodd's Well; Edrington Craigs; Chapel-hill, Belford, Thomp. Haidendean, &c. July, Aug. 2

175. STACHYS.

1. *S. sylvatica*, hairy, fetid; stem solid; leaves heart-shaped, stalked; flowers dull red, 6 in a whorl. *Hedge Woundwort.*

Hab. Woods, and under hedges. July, Aug. 2

2. *S. palustris*, root tuberous; leaves linear-lanceolate, half-embracing the hairy stem; flowers light purple, variegated, 6 to 10 in a whorl. *Marsh Woundwort.*

Hab. Moist fields and banks of ditches, common. Aug. 2

3. *S. arvensis*, stem weak; leaves heart-shaped, obtuse, crenate, slightly hairy; flowers 6 in a whorl, small, light purple, with a white and spotted palate. *Corn Woundwort.*

Hab. Sandy fields. "Below Lamberton, plentiful; about Doddington," Thomp. July, Aug. ☉

176. BALLOTA.

1. *B. nigra*, leaves ovate, undivided, serrated; calyx funnel-shaped, abrupt, with short spreading teeth; flowers in whorls, purple. *Black Horehound.*

Hab. Waste grounds, common near towns and villages. Aug. 2

177. MARRUBIUM.

1. *M. vulgare*, hoary, pubescent; stem erect; leaves roundish-ovate, unequally serrated; calyx-teeth 10, bristle-shaped, hooked backwards; flowers white, in dense convex whorls. *White Horehound.*

Hab. "On the rocks and links at Bamborough Castle," Winch. July. 2

The plant has been much employed in medicines for the asthma, though, we may remark, it does not enter into the composition of the *genuine* medicines sold in its name.

134 DIDYNAMIA—GYMNOSPERMIA.

178. CLINOPODIUM.

1. *C. vulgare*, leaves ovate, obscurely serrated; involucral leaves awl-shaped; flower-stalks branched; flowers in bristly crowded whorls, large, purple. *Wild Basil*.

Hab. Bushy places, and about hedges. "Ash-wood, Belford," Thomp. Road-side within a mile of Belford.
Aug. 2/

179. ORIGANUM.

1. *O. vulgare*, leaves ovate, entire; heads of flowers roundish, paniced, crowded, erect; involucral leaves ovate, smooth, longer than the calyx; flowers light purple or white. *Common Marjoram*.

Hab. Deans and bushy places, frequent. Aug. 2/

180. THYMUS.

1. *T. serpyllum*, stems recumbent; leaves flat, ovate, obtuse, entire, fringed at their base; flowers in small heads, purple. *Wild Thyme*.

Hab. Dry banks and heaths. July, Aug. 2/

181. SCUTELLARIA.

1. *S. galericulata*, leaves lanceolate, crenate, rugged, heart-shaped at the base; flowers axillary, in pairs, blue, pubescent. *Common Skull-cap*.

Hab. Wet marshy places. Allerton-mill dean, plentiful.
July, Aug. 2/

182. PRUNELLA.

1. *P. vulgaris*, stems a span high; leaves ovate-oblong, stalked; teeth of the upper lip of the calyx scarcely discernible; flowers deep purplish blue, in dense solitary erect whorled spikes; bracteas broad, heart-shaped. *Self-heal*.

Hab. Meadows, pastures, and road-sides. July, Aug. 2/

II. ANGIOSPERMIA.

183. BARTSIA.

1. *B. Odontites*, root fibrous; stem square, branched; leaves lanceolate, serrated, the upper ones alternate; flowers forming unilateral clusters, rose-coloured. *Red Bartsia*.

Hab. Meadows and pastures, on a cold and wet clay soil, common. July, Aug. ☉

184. RHINANTHUS.

1. *R. Crista-Galli*, stem slightly branched; leaves lanceolate, serrated; calyx smooth; style concealed by the upper lip; seeds with a dilated membranous border. *Common Yellow Rattle*.

Hab. Barren meadows and pastures. June. ☉

Stem a foot high, smooth, often spotted. Leaves somewhat crisp and fleshy, curiously marked on the under surface with characters of a paler green. Flowers axillary, but somewhat crowded and spiked, yellow, with a blue upper lip.

2. *R. major*, stem much branched; leaves linear-lanceolate, serrated; bractees taper-pointed; calyx smooth; style prominent; seeds slightly bordered. *Large Yellow Rattle*.

Hab. Corn fields in the north of England. "I also observed it this year, 1723, amongst the corn nigh Westnewton, in Northumberland, upon the borders of Scotland," Dr RICHARDSON. Though I have not observed it, yet others may probably find it in this neighbourhood. Mr WINCH remarks, it ought to be looked for in newly inclosed grounds. July. ☉

Larger than the preceding, with narrower leaves, and smaller flowers with a purple upper lip.

185. EUPHRASIA.

1. *E. officinalis*, stem 1-4 inches high, square; leaves ovate, sessile, furrowed, toothed; flowers white, with purple streaks and a yellowish palate. *Eye-bright*.

Hab. Heaths and barren pastures. July. ☉

“On the mountains of Scotland,” says Sir J. E. SMITH, “there is a more slender variety, with smaller but more richly tinted blossoms.” This we have found on our moors. The flowers are very pretty, purplish; and the crenatures of the leaves, in our specimens, are so obtuse, that they might with propriety be described as 5-lobed.

They who are “well seene in herbes” do much commend the E. as a precious medicine “to comfort the sight,”—hence, in MILTON, we have

————— “Then purg’d with euphrasy and rue
The visual nerve, for he had much to see.”

And its fame rests not on any real efficacy, but because it has a spot on the corolla something like a pupil, a character which, according to the doctrine of Signatures, is certainly indicative of marvellous virtues.

186. MELAMPYRUM.

1. *M. pratense*, leaves lanceolate, floral ones toothed at the base; flowers axillary, in partly distant pairs, turned to one side; corolla four times as long as the calyx, closed, lower lip direct. *Common Cow-wheat.*

Hab. Deans, no common. Ancroft dean, Mr J. Mannors. July. ☉

Stem 12--18 inches high, branched, smooth, as well as the bright green leaves. “Corolla pale at the base, deep yellow towards the summit, with a purple spot at each side of the mouth, which is closed, not gaping, the lower lip prominent and straight, not deflexed, palate elevated, orange-coloured.”—SM.

2. *M. montanum*, leaves linear, floral ones quite entire; flowers axillary, in partly distant pairs, turned to one side; corolla about twice as long as the calyx, closed, lip direct. (*Nova species.*)

Hab. On the south-east side of Cheviot, plentiful. June, July. ☉

Stem 3 or 4 inches high, square, pubescent, branched; branches opposite, simple. Cotyledon-leaves linear-obovate, entire. Leaves narrow, long, linear, often twisted, hairy all over, brownish-green. The floral leaves do not differ from the others. Flowers in pairs, turned to one side, on short stalks, pale yellow, with a white tube.

I. GYMNOSPERMIA.

168. AJUGA.

1. *A. reptans*, almost smooth; stem solitary, with creeping scions; leaves obovate, crenate; flowers blue, in whorls in the axils of the upper leaves; lower lip 4-cleft. *Common Bugle*.

Hab. Woods and moist meadows. In dry mountainous situations, as on Lamberton Moor, the plant becomes hairy. May, June. 74

169. TEUCRIUM.

1. *T. Scorodonia*, stem erect; leaves heart-shaped, hairy, serrated, stalked; flowers in lateral and terminal clusters, unilateral, pale yellow, with purple stamens. *Wood Sage*.

Hab. Woods and heathy bushy places, common. July. 74

“The whole plant is glutinous and bitter, with an agreeable aromatic scent, much resembling that of hops, for which it is said to be no bad substitute for making beer.”
—SM.

170. MENTHA.

1. *M. Piperita*, leaves stalked, ovate-lanceolate, smoothish; spikes elongated, interrupted below; flower-stalks and calyx smooth, purple, dotted; calyx-teeth fringed with hairs. *Peppermint*.

Hab. Sides of the rivulet below Lamberton Shields, Berwickshire, plentiful. Aug. Sept. 74

Our plant is the variety α of SMITH. There is only one other station where this species has been ascertained to grow wild in Scotland. It is extensively cultivated for medicinal purposes.

2. *M. hirsuta*, hairy; flowers capitate or whorled; leaves stalked, ovate; calyx clothed with erect hairs; flower-stalks with recurved ones. *Hairy Mint*.

(1) flowers in whorls so close together as to resemble a spike.

(2) flowers in axillary clusters from many of the uppermost leaves.

Hab. Watery places, very common. Aug. Sept. ¼

Mr MACDONALD of Scalpa, in the Hebrides, having some years ago suffered considerably by mice, put at the bottom, near the centre, and the top of each stalk, as it was raised, 3 or 4 stalks of wild mint, with the leaves on, gathered near a brook in a neighbouring field, and never after had any of his grain consumed. He then tried the same experiment with his cheese, and other articles kept in store, and often injured by mice, and with equal effect, by laying a few leaves, green or dry, on the articles to be preserved.

3. *M. rubra*, flowers whorled; leaves ovate; stem upright, zigzag (4 or 5 feet high); flower-stalks, and lower part of the calyx, very smooth; teeth hairy. *Red Mint*.

Hab. Reedy banks of rivers. "About Whiteadder Island," Thomp. I think I have observed it at the side of the Blackadder, below Mungo's Wells, Berwickshire. Sept. ¼

4. *M. gentilis*, flowers whorled; leaves ovate; stem much branched, spreading; flower-stalks, and base of the bell-shaped calyx, nearly smooth. *Bushy Red Mint*.

(1) leaves of an uniform green colour.

(2) leaves variegated with yellow.

Hab. (1) Sides of Wooler Water, near the Haugh-head, sparingly. (2) Side of the water course above the carding-mill at Wooler, apparently wild. Aug. ¼

5. *M. arvensis*, flowers whorled; leaves ovate; stem much branched, diffuse; calyx bell-shaped, covered all over with horizontal hairs. *Corn Mint*.

Hab. Moist sandy corn fields. "About New Water Haugh," Thomp. Plentiful on the fields about Stoney-muir Rig. June-Sept. ¼

171. GLECHOMA.

1. *G. hederacea*, creeping, downy; leaves kidney-heart-shaped, crenate; flowers blue, axillary. *Ground Ivy*.

Hab. Road-sides and hedge-banks. Dikes and hedges beyond the Magdalen Field farm-house; Tweed Banks beyond Gainslaw Ford, &c. Thomp. New-Water-Haugh Wood. At Richardson's Stead and Mountholy, &c. April, May. 7/

Was generally used for the purpose of clarifying ale, and giving it a flavour, till the reign of Henry VIII. about which period hops were substituted.—WITH.

172. LAMIUM.

1. *L. album*, leaves heart-shaped, pointed, strongly serrated, hairy; flowers white, about 20 in a whorl; tube of the calyx shorter than its teeth; upper lip of the corolla notched, lateral teeth solitary, lanceolate. *White Dead-nettle*.

Hab. Waste grounds. May, June,—also Sept. 7/

2. *L. purpureum*, stem leaflets in the middle; leaves heart-shaped, bluntish, unequally crenate, stalked, the upper ones crowded; calyx-teeth lanceolate; tube of the purplish-red corolla closed, near the bottom, with hairs. *Red Dead-nettle*.

Hab. Waste and cultivated grounds. May. ☉

3. *L. incisum*, stem leafless in the middle; leaves heart-shaped, dilated, stalked, irregularly cut, the upper ones crowded; tube of the red corolla internally naked, marginal teeth dilated, combined. *Cut Dead-nettle*.

Hab. Road-sides and in fields, frequent in this neighbourhood. May. ☉

4. *L. amplexicaule*, floral leaves sessile, kidney-shaped, obtuse, deeply crenate, partly lobed, clasping the stem; teeth of the calyx linear-awl-shaped, as long as its tube; flowers deep rose-colour. *Henbit Dead-nettle*.

Hab. Sandy fields and gardens, common. March-June. ☉

173. GALEOPSIS.

1. *G. Tetrahit*, bristly ; stem swelled below the joints ; leaves ovate, serrated ; corolla twice the length of the calyx, upper lip nearly straight. *Common Hemp-nettle*.

Hab. Cultivated fields, common. July, Aug. ☉

The flowers are reddish, cream-coloured, or white, with a spot on the lower lip variegated with purple and yellow. Labourers in harvest are sometimes affected with a severe inflammation of the hand, or of a finger, which they uniformly attribute to the sting of a *Day-nettle*, the name by which this plant is known amongst them. On examining its bristles, we perceive they consist of 3 or 4 tubular joints, and arise from a swollen base or vesicle*. On the upper part of the branches, on the calyx and flower, they are intermixed with others tipped with a gland. Now the former seem fitted, by their structure, for containing and emitting a fluid ; and, though in general too soft to wound, yet by chance, when rudely pressed, they may perforate the skin and lodge their contents, which must be virulently poisonous, if the opinion of the cause of the disease be correct.

2. *G. versicolor*, bristly ; stem swelled below the joints ; leaves ovate, serrated ; corolla thrice the length of the calyx, upper lip tumid, middle lobe of the lower heart-shaped. *Bee-Nettle*.

Hab. Corn-fields. "Near Burnhouses and Whitchester," Berwickshire, Rev. A. Baird. About Wooler, Mrs M. T. Johnston. Abundant in a field below Langleyford. In the west of Berwickshire. We observed it in great plenty between Huntly-wood and Ledgerwood, sometimes varying with a white lower lip. Aug. Sept. ☉

The flowers are large, yellow, the lateral lobes whitish, the lower one fine purple, bordered with white, and streaked in the throat. A very beautiful plant.

174. BETONICA.

1. *B. officinalis*, stem naked in the middle ; lower leaves on long stalks, upper sessile ; flowers crimson, in a dense spike, the lowest whorl a little remote. *Wood Betony*.

* This structure of the bristles is common to many plants of this natural order.

Calyx striped with green and reddish-brown; the segments setaceous, rough, shorter than the tube. Upper lip of the corolla villose internally; lower lip straight, in 3 acute short segments, slightly projecting; the palate raised, orange. Anthers green and brown, pubescent, on smooth filaments. The flower is generally unspotted, but sometimes there are 4 small obscure spots on the lower lip, placed distantly, and not on the mouth.

It is not without hesitation that I give this as a species distinct from the preceding, since the differences may be attributed to situation, for we know that an alpine station does alter the aspect of plants to a considerable extent. In estimating the force of this objection, we can only reason from what we observe to be the effect of a similar situation on plants of the same natural order. Now, the *Rhinanthus Crista-Galli* is a plant of this kind, and we find it growing with this *Melampyrum* undiminished in height, and unaltered in appearance. And, were the objection valid, we might expect the plant at the base of the hill to be much in its usual state, and gradually diverging from it as it attained higher limits; but this was not the case, for it was very uniform in character over a surface of many acres.

187. PEDICULARIS.

1. *P. palustris*, stem solitary, branched, 1 foot high; leaves all doubly pinnatifid; calyx ovate, hairy, ribbed, in 2 unequally notched lobes; flowers crimson. *Marsh Louse-wort*.

Hab. Marshes and boggy meadows, common. July. ♀?

2. *P. sylvatica*, stem several, spreading, simple; radical leaves ovate; calyx oblong, angular, smooth, in five unequal notched segments; flowers rose-coloured. *Dwarf Lousewort*.

Hab. Heaths, common. Longridge dean. Lamberton Moor, &c. A white flowered variety has repeatedly occurred to us. July. ♀

188. ANTIRRHINUM.

1. *A. Linaria*, stem erect; leaves linear-lanceolate, crowded; spikes terminal; flowers imbricated, yellow with an orange-coloured palate; calyx smooth, shorter than the spur. *Yellow Toadflax*.

Hab. Borders of fields, and gravelly banks, frequent. July, Aug. ♀

2. *A. minus*, stem much branched, spreading; leaves lanceolate, obtuse, downy, mostly alternate; calyx longer than the spur; flowers small, purplish, the lower lip yellow. *Least Snapdragon*.

Hab. Sandy fields, very rare. Bank above the Union Bridge, Durham, Dr Thompson. July. 2/

189. SCROPHULARIA.

1. *S. nodosa*, smooth; root tuberous; stem sharp-edged; leaves heart-shaped, acute, serrated, 3-ribbed at the base; flowers dull green with a livid purple lip. *Knotty-rooted Figwort*.

Hab. Woods and hedges, frequent. About the mouth of the Whiteadder, Thomp. July. 2/

190. DIGITALIS.

1. *D. purpurea*, downy; leaves ovate, crenate; flowers large, purple; segments of the calyx ovate, acute; corolla obtuse, its upper lobe scarcely cloven. *Foxglove*.

Hab. Gravelly or sandy pastures. Edrington Craigs, Thomp. Rare in the immediate vicinity, but very common about Houndwood and Renton Inns; and near Wooler. July. ♂

The history of this plant might afford a practical answer to such as sneer at the pursuits of the botanist, and are continually asking *Cui bono?* For it grew neglected, until Dr WITHERING, a botanist, made known its virtues, and gave to medicine one of its most valuable auxiliaries. It is most beneficial in dropsical and inflammatory complaints, and in diseases of the heart and of the lungs; but great caution is required in its use.

CLASS XV.

TETRADYNAMIA.

“ The spleen is seldom felt where Flora reigns.”

COWPER.

——“ I have cured weak stomachs by engaging the persons in the study of Botany, and particularly in the investigation of our native plants.” — Dr CULLEN.

I. SILICULOSA.

* *Cotyledons accumbent.*

191. DRABA. *Pouch* entire, laterally compressed, valves nearly flat; *seeds* numerous.
198. CRAMBE. *Pouch* globose, stalked, coriaceous, of 1 cell, without valves, deciduous; *seed* solitary.
197. CAKILE. *Pouch* angular, of 2 joints, each of 1 cell, without valves, the uppermost deciduous; *seed* solitary.
195. COCHLEARIA. *Pouch* nearly entire, turgid, rugged, of 2 valves; *seeds* numerous.
194. THLASPI. *Pouch* cloven, inversely heart-shaped, the valves with a bordered keel; *seeds* numerous.

Sow. *Fung. t.* 317. *S. complanata*, MOUG. and NEST., No. 82. *Eustegia ilicis*, *Bot. Gall. ii.* 717.

Hab. On dead holly leaves.

At first the spots are level with the surface of the leaf, but the upper part separates, and they then become excavated.

4. *X. Geranii*, spots small, black, roundish, even with the surface or slightly raised, rough or granulated; interior black.—GREV. *Fl. Edin.* 368.

Hab. On the leaves of the wood crane's-bill.

5. *X. populinum*, spots small, thickened, clustered, roundish or angular and subconfluent, reddish-brown, becoming black.—*Bot. Gall. ii.* 875. *Sclerotium populneum*, GREV. *Fl. Edin.* 463.

Hab. On decaying leaves of poplars, common.

Xyloma populinum of GREVILLE is a different plant.

6. *X. salicinum*, spots thickened, scattered or clustered, roundish or angular, rugose, at first orange-coloured, becoming brown, and ultimately dark brown.—*Bot. Gall. ii.* 875. *Sclerotium salicinum*, GREV. *Fl. Edin.* 462.

Hab. On the leaves of *Salix caprea*, frequent.

Very distinct from *X. salignum*, and more evidently a diseased and thickened state of the leaf.

7. *X. Rosæ*, on branches, clustered, often confluent, compact, orbiculate, convex, greyish-black, covered by the epidermis, which is at last irregularly ruptured.—*Bot. Gall. ii.* 876.

Hab. On branches of the wild roses, the part affected being swollen and uneven.

8. *X. Spireæ*, spots irregular, effused, black, nearly smooth, slightly raised.—MOUG. and NEST., No. 760. *Leptostroma Spireæ*, *Bot. Gall. ii.* 726.

Hab. Generally on the dead stalks of the meadow-sweet, but my specimens are on one of the lesser *umbelliferæ*.

In July and August, the upper surface of the leaves of the coltsfoot are often marked with large irregular spots of a reddish-brown colour, mapped with black excavated lines, which are irregularly branched and dilated at intervals. The spots are even with the surface,—a discoloration rather than a disease; but the lines have extended into the substance of the leaf, and are apparently of a parasitic nature. They are too regular in their appearance, and too curiously ramified, to be produced by mere decay or mortification; nor are they the work of insects, but as I cannot discover any decided traces of organization, I would not raise the thing to the rank of a vegetable, nor give it a name.

73. CEUTHOSPORA.

1. *C. phacidoides*, subcircular, plane, or slightly convex, glossy black, smooth, the apex bursting at length by 3–5 short pale segments; interior brown.—GREV. *Crypt. Fl.* t. 253. *Phascidium multivalve*, MOUG. and NEST., No. 560. *Sphæria bifrons*, SOW. *Fung.* t. 316. *Cryptosphæria bifrons*, GREV. *Fl. Edin.* 361.

Hab. On leaves of the holly, the spots visible on both sides at opposite points.

74. ERYSIPHE.

Obs.—The *Erysiphe* grow upon living leaves. They form diffused pulverulent or cobweb-like spots on the surface by a tissue of fine appressed filaments, amid which a careful eye discovers minute sessile globules scattered in profusion. The filaments are of two kinds: the one, termed by Dr GREVILLE the radicular, are short, rigid, generally of a darker colour, and perhaps organically attached to the globules; the other are longer, white, and interwoven, and because they are produced previous to the appearance of the globules, are named the primary. The globules themselves are always at first of a yellowish-colour, becoming brown and ultimately black. They are filled with oval grains, which appear to be capsules, and each of which is said by DECANDOLLE to contain two seeds, but the number is frequently greater.

1. *E. communis*, base effused, areneous, whitish; radicular filaments simple, white, affixed to the base; globules spherical, scat-

142 TETRADYNAMIA—SILICULOSA.

195. COCHLEARIA.

1. *C. officinalis*, smooth; radical leaves roundish, those on the stem oblong and somewhat sinuated; flowers white; pouch globose. *Common Scurvy-grass*.

Hab. Plentiful on our sea-coast; also on dikes near the Magdalen-field farm-house. May. ☉

A useful plant in the sea-scurvy.

2. *C. danica*, stems prostrate; leaves all triangular and stalked; pouch elliptical, reticulated with veins. *Danish Scurvy-grass*.

Hab. On the Pinnacles, one of the Fern Islands, Dr Thompson. May, June. ☉

Stems numerous, spreading, about 2 inches long, smooth. Leaves all stalked, lobed near the base. Flowers small, white. Pouches numerous, large, oval, tipped with a short style, reticulated with prominent veins. Seeds from 6 to 9 in each cell, brown, rough.

196. SENEBIERA.

1. *S. coronopus*, stem spreading, much branched; leaves pinnatifid, subdivided; flowers very small, white, opposite to the leaves, densely corymbose; pouch undivided, crested with little sharp points; style prominent. *Swine's-cress*.

Hab. Waste ground and road-sides, very common in the immediate vicinity; and on Holy Island. June—Aug. ☉

197. CAKILE.

1. *C. maritima*, herb smooth, branched; leaves fleshy, pinnatifid, obtuse; flowers rather large, purplish; joints of the pouch two-edged, the upper one arrow-shaped. *Sea Rocket*.

Hab. Frequent on our sandy sea-coast. June, Sept. ☉

198. CRAMBE.

1. *C. maritima*, longer filaments toothed; leaves roundish, sinuated, wavy, toothed, glaucous, very smooth as well as the stem; flowers white, in clustered panicles. *Sea Kale*.

Hab. "On the shore by Fastcastle, in Berwickshire,"
Dr Parsons. June. 7

Sea Kale is now common in gardens. The young shoots come early, and are much esteemed. "The precise period of its introduction to the garden is unknown. PARKINSON and BRYANT state, that the radical leaves are cut by the inhabitants where the plant grows wild, and boiled as cabbage; and JONES, of Chelsea, assured the late CURTIS, that he saw bundles of it, in a cultivated state, exposed for sale in Chichester market in 1753. MAHER states, that the *C. maritima* was known, and sent from this kingdom to the Continent, more than 200 years ago, by LOBEL and TURNER; but MILLER, in 1731, was the first who wrote upon it professionally. About the year 1767, it was cultivated by Dr LETTSOM at Grove Hill, and by him brought into general notice in the neighbourhood of London."—LOUDON.

II. SILIKUOSA.

199. CARDAMINE.

1. *C. hirsuta*, more or less hairy; leaves pinnate, without stipulas, leaflets stalked, roundish-oblong, notched; flowers small, white. *Hairy Ladies'-smock*.

Hab. Shady places. "Near St Abb's Head," Rev. A. Baird.
On a rough stone-wall below the Union Bridge, sparingly. Frequent in the gravelly bed of Wooler Water.
May, June. ☉

In the last station the stem of the plant is erect, flexuose, nearly smooth and simple. *C. flexuosa*, WITHERING, 715.

2. *C. pratensis*, leaves pinnate, without stipulas, leaflets of the radical ones roundish and toothed, those of the stem leaves lanceolate, entire; flowers large, light purple; petals with a tooth upon the claw. *Meadow Ladies'-smock*.

Hab. Meadows and moist pastures. May. 7

The flowers were at one time supposed to be useful in spasmodic diseases, as epilepsy, for the cure of which they are recommended by RAY and Sir G. BAKER, but they have fallen into neglect. They come with the cuckoo, whence, in some parts, the people call it the *Cuckoo-flower*; and they cover the meadows as with linen bleaching, which is supposed to be the origin of the name we have adopted, as being more classical. Thus SHAKSPEARE,

“ When daisies pied, and violets blue,
And *Lady-smocks* all silver-white,
And Cuckoo-buds of yellow hue,
Do paint the meadows with delight.”

3. *C. amara*, stem creeping at the base; leaves pinnate, without stipulas, leaflets of the lowermost roundish, of the rest toothed or angular; flowers white with violet anthers; style obliquely elongated. *Bitter Ladies'-smock*.

Hab. Watery places, rare. Banks of the Eye about Netherbyres, Rev. A. Baird. May. 2/

More likely to be passed by as a *Water-cress*, than mistaken for any variety of the preceding. Dr HOOKER says, the flowers are larger than those of the *pratensis*, and SMITH describes them as of the same size; but in our specimens they are not more than half as large.

200. NASTURTIIUM.

1. *N. officinale*, leaves pinnate, leaflets roundish-heart-shaped, wavy; flowers white. *Common Water-cress*.

Hab. Ditches and water-courses. June, July. 2/

Near London the *Water-cress* is regularly cultivated, and it is perhaps the best and most wholesome of our salad herbs.

2. *N. sylvestre*, leaves pinnate, leaflets lanceolate, deeply serrated or cut; root creeping; flowers yellow, the petals much longer than the calyx. *Creeping Yellow-cress*.

Hab. Wet gravelly places. River-side a little above West Ord, Dr Thompson. About the Union Bridge. Aug. 2/

3. *N. terrestre*, leaves pinnatifid, unequally toothed; root tapering; flowers yellow, the petals scarcely so long as the calyx; pod curved. *Annual Yellow Cress*.

Hab. Watery places. About Ladykirk and Norham, Mr W. Baird. Sides of the Tweed from West Ord to Norham, plentiful. In the pond below Calf-hill; and at the Cow-port. June, July. ☉

The root is simple and spindle-shaped; but in a specimen, which measured upwards of two feet in height, we found it a dense bunch of fibres. The stem is frequently purplish, as are also the leaves, which are occasionally somewhat bristly on the margins. Pods short, cylindrical, thick, on patent curved stalks longer than themselves, tipped with a short style crowned with a peltate stigma. The plant rarely exceeds a foot in height, and is often much less.

201. SISYMBRIUM.

1. *S. officinale*, stem rough with reflexed bristles; leaves runcinate, hairy; flowers small, pale yellow; pods pressed close to the main stalk, awl-shaped, downy. *Common Hedge-mustard*.

Hab. Wastes and road-sides. June, July. ☉

2. *S. Irio*, leaves runcinate, toothed, smooth as well as the stem; flowers yellow; pods erect, long, slender. *London Rocket*.

Hab. On the walls of Berwick-upon-Tweed, Ray. Most abundant at the Pier-gate. July, Aug. ☉

3. *S. Sophia*, leaves doubly pinnatifid, a little hairy; flowers small, greenish-yellow, the petals smaller than the calyx. *Flix-weed*.

Hab. Waste ground near villages. About East-Ord, Etall, and Bamborough, Thomp. July—Sept. ☉

202. BARBAREA.

1. *B. vulgaris*, smooth; lower leaves lyrate, the terminal lobe roundish; upper obovate, toothed; flowers yellow; pods an inch long. *Yellow Rocket*.

Hab. Sides of the Tweed and Whiteadder; also at hedge bottoms in moist situations, frequent. A double flowered variety is common in gardens. May—Aug. 2/

2. *B. præcox*, smooth; lower leaves lyrate; upper deeply pin-natifid, with linear-oblong entire segments; flowers small, yellow; pods about three inches long. *Early Winter-cress*.

Hab. Hedge-side between Wooler and Earl. April—Oct.
♂

Cultivated in many gardens as a salad-herb, under the name of *American Cress*.

203. ERYSIMUM.

1. *E. Alliaria*, smooth; leaves heart-shaped, broadly toothed, stalked; flowers white. *Garlick-mustard*, or *Jack-by-the-hedge*.

Hab. Hedge-sides and shady lanes. Near Lint-hill, Berwickshire, Rev. A. Baird. Near Haggerston. North side of the Tweed above the Union Bridge. May, June. ☉

The whole plant scents strongly of garlic. It is occasionally used as a sallad. "When gathered, as it approaches the flowering state, boiled separately, and then eaten to boiled mutton, it certainly forms a most desirable pot-herb; and to any kind of salted meat, an excellent green." NEILL.

204. CHEIRANTHUS.

1. *Ch. fruticosus*, stem shrubby; branches angular; leaves lanceolate, acute, most hoary beneath, with simple close hairs; style prominent; flowers yellow. *Wild Wall-flower*.

Hab. On the ruins of all the old castles in the neighbourhood; also on Spindlestone rocks. June. ♀

205. ARABIS.

1. *A. Thaliana*, stem branched; leaves hairy, more or less toothed, radical ones stalked, oblong; flowers small, white; stamens not much shorter than the petals; pods pointing upwards, slender, smooth. *Common Wall-cress*.

Hab. Walls and dry banks, not common. In the ravine above Burnmouth. Amongst the debris of Kyles Rocks. Abundant on walls below the Chain Bridge, and about Warren. April, May. ☉

206. BRASSICA.

1. *B. Napus*, root spindle-shaped; leaves smooth, upper ones lanceolate, heart-shaped at their base, clasping the stem, lower ones lyrate, toothed; flowers yellow. *Rape-seed.*

Hab. Corn-fields and road-sides occasionally, but not any where truly wild. May. ♂

“Cultivated for the oil produced by the seeds; and the seeds, by pressure, are formed into cakes, which, after the extraction of the oil, are useful for manure, as well as for fattening cattle.”

2. *B. Rapa*, root stem-like, fleshy, orbicular, depressed; radical leaves lyrate, rough, those of the stem smooth, the uppermost entire; flowers yellow. *Common Turnip.*

Hab. Cultivated fields and their borders, but not wild. April. ♂

As an object of agriculture, the Turnip was introduced into this country by Lord TOWNSEND, in the reign of GEO. I.

207. SINAPIS.

1. *S. arvensis*, rough; leaves toothed, partly lyrate or hastate; flowers yellow; pods with many angles, rugged, longer than their own awl-shaped beak. *Wild Mustard.*

Hab. Corn-fields, too common. May. ☉

2. *S. alba*, rough; leaves lyrate; flowers yellow; pods bristly, rugged, spreading, shorter than their own flat two-edged beak. *White Mustard.*

Hab. Corn-fields, common. June. ☉

Cultivated for the sake of the young herbs, which are used in sallads; and for the seeds, which have long been a popular remedy in rheumatism, and of late have become fashionable in dyspeptic complaints.

3. *S. nigra*, lower leaves lyrate, upper linear-lanceolate, entire, smooth, more or less pendulous; flowers yellow, small; pods quadrangular, smooth, slightly beaked, close-pressed to the stalk. *Common Mustard.*

Hab. Fields and waste grounds. “North side of the

Whiteadder from the boundary to Edrington Craigs, plentiful," Thomp. Ord Fields sparingly, Dr Thompson. June. ☉

Table-mustard is prepared from the seeds of this species.

4. *S. tenuifolia*, stem smooth; leaves once or twice pinnatifid, the uppermost undivided; flowers large, pale yellow; pods erect, on spreading stalks, linear, compressed, slightly beaked; seeds 2-ranked. *Wall Mustard*.

Hab. On the walls of Berwick, Ray; where it still grows.
June—Oct. 7

208. RAPHANUS.

1. *R. Raphanistrum*, leaves lyrate, rough; flowers large, pale yellow, veined; pods jointed, striated, of one cell. *Charlock*.

Hab. Corn-fields. June, July. ☉

"A noisome weed, that without profit sucks
The soil's fertility from wholesome flowers."

The seeds, mixed with bread, are said, by LINNÆUS and others, to produce a severe spasmodic disease, which, in wet seasons, is common in Sweden.

CLASS XVI.

MONADELPHIA.

—“ Not a flower

But shows some touch in freckle, streak, or stain,
Of HIS unrivalled pencil. He inspires
Their balmy odours, and imparts their hues,
And bathes their eyes with nectar, and includes,
In grains as countless as the sea-side sands,
The forms, with which He sprinkles all the earth.
Happy who walks with Him! whom what he finds
Of flavour, or of scent in fruit or flower,
Or what he views of beautiful or grand
In Nature, from the broad majestic oak
To the green blade, that twinkles in the sun,
Prompts with remembrance of a present God.
His presence, who made all so fair, perceived,
Makes all still fairer.”

COWPER.

I. PENTANDRIA.

209. *ERODIUM.* *Style 1; fruit beaked, of 5 aggregate capsules,*
each tipped with a spiral *awn*, bearded on the inside.

II. DECANDRIA.

210. *GERANIUM.* *Style 1; fruit beaked, of 5 aggregate capsules,*
each tipped with a recurved naked *awn*.

III. POLYANDRIA.

211. MALVA. *Styles* numerous ; *outer calyx* of 3 leaves ; *capsules* whorled, single-seeded.

I. PENTANDRIA.

209. ERODIUM.

1. *E. cicutarium*, stems procumbent, hairy ; stalks many-flowered ; leaves pinnate, leaflets sessile, pinnatifid, cut ; stamens simple. *Hemlock Stork's-bill*.

Hab. Dry sandy pastures and waste grounds, common.

On the Links from Spittal southward, the variety with *white* flowers is the most common ; but remote from the sea, the flowers are invariably *rose-coloured*. June—Aug. ☉

Among the numberless instances of obvious design in the structure of the seeds and seed-vessels of plants, few are, perhaps, more remarkable, or more strikingly display themselves as the workmanship of an intelligent Artificer, than that which we meet with in the seeds of *E. cicutarium*. The seeds surround the pistil at its base ; each seed is covered with a coat peculiar to itself ; which, after having inclosed the seed, runs out, in the form of a narrow appendage, to the extremity of the style, to which it is slightly connected along its whole length, and which has five grooves to receive the five seeds with their appendages. Each of these appendages has the property of contracting itself into a spiral form when dry, and of again extending itself into a right line when moist. In short, it is a spiral spring, which lengthens or contracts itself as it happens to become wet or dry. This power first exerts itself when the seed and its appendage become dry by maturity, when it gradually separates the seed from its parent plant. The seed, thus disengaged, is continually contracting and dilating itself, as the weather changes from wet to dry, and from dry to wet ; and by this means is kept in motion, till it is either destroyed by the vicissitudes of the seasons, or meets with some crevice in the earth, or some light porous spot, into which it can easily insinuate itself, and from thence, in due time, produce a new plant.—See WITHERING, iii. 753.

II. DECANDRIA.

210. GERANIUM.

1. *G. sylvaticum*, stem erect; leaves about 7-lobed, cut and serrated; stalks 2-flowered, somewhat corymbose; flowers large, light purple, veined; stamens awl-shaped, fringed; capsules hairy all over. *Wood Crane's-bill*.

Hab. Woods about Houndwood and Renton, Berwickshire. Banks of Wooler Water above and below Langley-ford. June, July. ♀

2. *G. pratense*, leaves in about 7 deep segments, sharply pinnatifid and serrated; stalks 2-flowered; flowers larger, blue; stamens smooth, much dilated at the base; capsules hairy all over. *Meadow Crane's-bill*.

Hab. Road-sides, and banks of rivers and ditches, frequent. June, July. ♀

3. *G. Robertianum*, stem spreading, red; leaves somewhat pedate, pinnatifid, 5-angled; stalks 2-flowered; flowers purple; calyx with 10 angles; capsules wrinkled, simply keeled. *Stinking Crane's-bill*, or *Herb-Robert*.

Hab. Woods, and rough stony places frequent. May—Oct. ☉

This herb has a strong disagreeably pungent smell, especially after rain. In autumn it assumes a deep red hue.

4. *G. lucidum*, shining, smooth; leaves 5-lobed, rounded; stalks 2-flowered; flowers small, rose-coloured; calyx pyramidal, transversely wrinkled; capsules wrinkled, triply keeled. *Shining Crane's-bill*.

Hab. Rocky banks of the Eye opposite Netherbyres, Rev. A. Baird. May—Aug. ☉

5. *G. molle*, stems spreading, downy; stalks 2-flowered, alternate, opposite to the leaves, which are rounded, many-lobed, notched and downy; flowers small, purple, with cloven petals;

capsules numerously wrinkled, smooth; seeds without dots.
Downy Crane's-bill.

Hab. Cultivated and waste grounds, very common. April
 —Aug. ☉

6. *G. pusillum*, stalks 2-flowered; flowers bluish-purple, the petals notched, and scarcely extending beyond the calyx; leaves kidney-shaped, palmate, cut, downy; capsules keeled, even, clothed with erect hairs; seeds without dots; anthers only 5.
Small-flowered Crane's-bill.

Hab. Gravelly fields and waste grounds. "Hedges near Paxton," Thomp. June—Sept. ☉

7. *G. dissectum*, stalks 2-flowered; flowers small, purplish, the petals cloven, rather shorter than the much awned calyx; leaves in 5 deep lacinated segments; capsules hairy; seeds reticulated.
Jagged-leaved Crane's-bill.

Hab. Road-sides and pastures, particularly in new pastures on a gravelly soil, common. May, June. ☉

8. *G. sanguineum*, stalks single-flowered; flowers large, crimson; leaves roundish, in 5 or 7 deeply separated, 3-cleft lobes; capsules even, bristly at the summit; seeds minutely wrinkled.
Bloody Crane's-bill.

Hab. On the Links of Holy Island, Winch. Sea-banks at Hudshead; and on the Links from Scrammerston southwards, abundant, and highly ornamental. July—Sept. 7

III. POLYANDRIA.

211. MALVA.

1. *M. sylvestris*, stem upright, herbaceous, much branched; leaves with 7 acute lobes; footstalks and flowerstalks hairy; flowers large, purple, veiny. *Common Mallow.*

Hab. Waste places and road-sides. June—Aug. 7

The leaves boiled are in common use amongst the poor as a poultice, to which they ascribe many opposite virtues. It is as good and cheaper than one of bread and milk.

2. *M. rotundifolia*, stems prostrate, scarcely branched; leaves roundish heart-shaped, bluntly 5-lobed; stalks when in fruit bent downwards; flowers small, pale lilac. *Dwarf Mallow*.

Hab. Waste ground near villages. June—Sept. ☉

3. *M. moschata*, stem erect; radical leaves kidney-shaped, cut, the rest in 5 deep pinnatifid jagged segments; calyx hairy, its outer leaves linear-lanceolate; flowers large, rose-coloured. *Musk Mallow*.

Hab. Meadows rare. Fishwick Mains on the Tweed; foot of Foxburnheugh, Berwickshire, Mr W. Baird. On the plain between Edrington Mill and the Whiteadder, sparingly. Aug. 7

CLASS XVII.

DIADELPHIA.

" Then *names* are good, for how, without their aid
 Is knowledge gained by man, to man conveyed ?
 But from that source, shall all our pleasure flow ?
 Shall all our knowledge be, these names to know ?
 Then he with memory blest, shall bear away
 The palm from GREW, and MIDDLETON, and RAY :
 No ! let us rather seek in grove and field,
 What food for wonder, what for use they yield ;
 Some just remark, from Nature's people bring,
 And some new source of homage for her King."

CRABBE.

 I. HEXANDRIA.

212. FUMARIA. *Calyx* of 2 leaves ; *corolla* ringent, prominent, and bearing honey at the base ; each *filament* with 3 anthers.

II. OCTANDRIA.

213. POLYGALA. Two segments of the *calyx* like wings ; *standard* of the *corolla* cylindrical ; *capsule* of 2 cells and 2 valves ; *seeds* solitary, crested.

III. DECANDRIA.

* *Stamens all connected at the base, the tube mostly split along its upper side.*

214. SPARTIUM. *Filaments all forming a simple tube; stigma lateral, linear, hairy; legume flat.*

215. GENISTA. *Filaments upwards in 2 sets; stigma terminal, somewhat capitate; legume turgid; pistil depressing the keel; standard reflexed.*

216. ULEX. *Calyx of 2 leaves, nearly as long as the legume.*

218. ANTHYLLIS. *Calyx inflated, including the legume. (Flowers capitate.)*

217. ONONIS. *Calyx in 5 deep segments; standard striated; legume rhomboid, sessile.*

* * *Stigma or style downy; without the character of the former section.*

219. OROBUS. *Style linear, nearly cylindrical; stigma along the upper side downy.*

220. LATHYRUS. *Style flattened vertically; stigma along the dilated upper half of the style downy.*

221. VICIA. *Style bearded in front below the stigma.*

222. ERVUM. *Stigma capitate, all over downy.*

* * * *Legume more or less perfectly 2-celled; without the former characters.*

223. ASTRAGALUS. *Legume tumid, of 2 longitudinal cells.*

* * * * *Legume with scarcely more than 1 seed; without the former characters.*

224. TRIFOLIUM. *Legume hardly longer than the calyx, with 1 seed, rarely more, deciduous, not bursting.*

* * * * * *Legume either jointed or spiral ; without the former characters.*

226. **MEDICAGO.** *Legume spiral, compressed, somewhat membranous ; pistil pressing the keel downwards.*

* * * * * *Legume of 1 cell with numerous seeds ; without the former characters.*

225. **LOTUS.** *Legume cylindrical, spongy within ; wings converging at their upper edges ; filaments partly dilated.*

I. HEXANDRIA.

212. FUMARIA.

1. *F. claviculata*, stem climbing, slender ; leaves pinnate, then pedate or ternate, with elliptical entire leaflets and branched tendrils ; flowers yellowish-white ; pods lanceolate, undulated, with 3 or 4 seeds. *Climbing Fumitory.*

Hab. Amongst the rocks in Longridge Dean, plentiful.
July—Oct. ☉

2. *F. officinalis*, stem spreading, branched ; leaves twice or thrice pinnate, leaflets wedge-shaped, with flat lanceolate segments ; flowers rose-coloured, with a dark apex, in a rather lax cluster ; pods single-seeded, globose, abrupt, on upright stalks, twice as long as the bracteas. *Common Fumitory.*

Hab. Cultivated fields, common. May—Aug. ☉

Dr CULLEN recommends the expressed juice of this herb, in a dose of two ounces twice a-day, to cleanse the skin from leprous disorders ; and for the same purpose it had been long previously recommended by the older herbalists. An infusion of the leaves is used as a cosmetic to remove freckles and clean the skin.

II. OCTANDRIA.

213. POLYGALA.

1. *P. vulgaris*, stems ascending, simple, herbaceous; leaves linear-lanceolate; bractes 3, at the base of each flower-stalk, deciduous; wings about equal to the corolla; flowers crested, blue, pink or white. *Milkwort*.

Hab. Dry hilly pastures, common. June, July. 4

III. DECANDRIA.

214. SPARTIUM.

1. *S. Scoparium*, leaves ternate or solitary; branches angular, without thorns; filaments all in one set at the base; legume fringed. *Common Broom*.

Hab. Dry gravelly fields, and in deans. June. 2

The most celebrated station for the Broom in Berwickshire, or perhaps in the United Kingdom, is Cowdenknows, an undulatory rising ground, of great beauty, in the west of the county. The broom extended over the whole hill, and is said to have been so tall and luxuriant, that a man on horseback, riding through it, could not be seen.

“ More pleasant far to me the broom
So fair on Cowdenknowes,
For sure so sweet, so soft a bloom,
Elsewhere there never grows.”

But *there* it grows no longer, having been eradicated, to give place to corn and turnips, and the other useful vulgarities of the farm.—It is still plentiful, however, in the vicinity, and a relic of the “bonnie broom” from the *Knowes* themselves, may still be gathered in the pleasure grounds surrounding the mansion of the proprietor.

A decoction of the young tops is a good remedy in dropsies. “That worthy prince of famous memorie, HENRY VIII., King of England, was wont to drinke the distilled water of Brome floures, against surfets and diseases thereof arising.” In the neighbourhood of Ghent, Broom is sown with the view of improving poor sandy

soils; and the young flower-buds, gathered in the spring, are often used as a pickle, and as a substitute for capers.
—Mr NEILL.

215. GENISTA.

1. *G. tinctoria*, stems depressed, with round, striated, erect, thornless branches; leaves lanceolate, smooth; flowers yellow, nearly sessile. *Dyer's Greenweed*.

Hab. Gravelly banks. Haiden dean. July, Aug. h

The whole plant affords the dyer a good yellow colour, and with woad a good green.

216. ULEX.

1. *U. europæus*, teeth of the calyx obsolete, converging; bractæ ovate, lax; branches erect. *Whin or Gorse*.

Hab. Moors, &c. common. May. h

—“Rough

With prickly *Gorse*, that, shapeless and deformed,
And dangerous to the touch, has yet its bloom,
And decks itself with ornaments of gold.”

. “there the turf

Smells fresh, and, rich in odoriferous herbs
And fungous fruits of earth, regales the sense
With luxury of unexpected sweets.”

Will make fences upon the bleaker mountains, and close to the sea-side, where the spray of the sea kills almost every other shrub. In Cornwall, where fuel is scarce, it is cultivated to advantage, and is generally cut to make faggots for heating ovens, which it does very soon, burning rapidly, and with a great degree of heat. In Ireland, when hay is dear, the lower order of country people sometimes make a livelihood by selling chopped whins to the inhabitants of towns, for their cattle, by the bushel. “I have,” says Dr RICHARDSON, “great experience of this food, being obliged to recur to it every third or fourth year, during the twenty-six I have been a farmer; it is strong and nutritive; considered by many as the best substitute for oats, when that more nourishing food cannot be procured.”—See *Pamphleteer*, vol. viii. p. 178, and EVELYN'S *Sylva*, p. 410.—The Irish Whin, Mr NEILL informs me, is much softer than ours, and a different species, *U. stricta*.

217. ONONIS.

1. *O. arvensis*, stem hairy ; branches at length spinous ; flowers mostly solitary, rose-coloured ; leaves generally simple, entire towards their base. *Rest-harrow*.

Hab. Sandy sea-coast, as on Spittal Links ; and borders of fields, common. June—Aug. 7/

218. ANTHYLLIS.

1. *A. vulneraria*, herbaceous ; leaves pinnate, unequal ; flowers yellow, in a pair of crowded terminal heads. *Ladies'-finger*.

Hab. Dry pastures. Sea and river banks, plentiful, Thomp. June—Aug. 7/

219. OROBUS.

1. *O. tuberosus*, stem simple, erect ; leaves pinnate, elliptic-lanceolate ; stipulas half-arrow-shaped, toothed at the base ; flowers in axillary loose clusters, purple, veined. *Heath Pea*.

Hab. Heaths and deans. May, June. 7/

“ But among the useful plants, the *Corr* or *Cor-Meille* must not be omitted, whose roots dried are the support of the Highlanders in long journeys, amidst the barren hills destitute of the supports of life ; and a small quantity, like the alimentary powders, will, for a long time, repel the attacks of hunger. Infused in liquor, it is an agreeable beverage, and, like the *Nepenthe* of the Greeks, exhilarates the mind. From the similitude of sound in the name, it seems to be the same with *Chara*, the root discovered by the soldiers of Cæsar, at the siege of Dyrrachium, which, steeped in milk, was such a relief to the famished army. Or we may reasonably believe it to have been the *Caledonian* food described by Dio, of which the quantity of a bean would prevent both hunger and thirst ; and this, says the historian, they have ready for all occasions.”—
PENNANT.

2. *O. sylvaticus*, stems recumbent, hairy, branched ; leaves pinnate, hairy, leaflets numerous, ovate-lanceolate ; flowers white, striated with purple. *Wood Bitter-vetch*.

Hab. “ Observed also by Dr Burgess in great plenty on a bank facing the Tweed, on the north side, about a

quarter of a mile below the public house at the Beild,"
Lightfoot. "Near Longformacus," Berwickshire, Rev.
A. Baird. July. ʒ

220. LATHYRUS.

1. *L. pratensis*, smooth ; stalks many-flowered ; flowers yellow ; tendrils mostly simple, each bearing a pair of lanceolate leaflets. *Meadow Vetchling*.

Hab. Moist meadows and pastures, common. Cattle are fond of it. July, Aug. ʒ

221. VICIA.

* *Stalks elongated, many-flowered.*

1. *V. sylvatica*, smooth ; leaflets elliptical ; stipulas crescent-shaped, deeply toothed ; flowers white, streaked with bluish veins. *Wood Vetch*.

Hab. Woods and bushy places. Banks beyond the Needle-eye ; Tweed banks beyond Ord Mill, Thomp. July, Aug. ʒ

One of our most elegant wild plants ; well worthy to decorate shrubberies, or to be trained over a treillis or bower ; SMITH,—and so Sir WALTER SCOTT seems also to think,

"And where profuse the Wood Vetch clings
Round Ash and Elm in verdant rings,
Its pale and azure-pencilled flower
Should canopy Titania's bower."

2. *V. Cracca*, downy ; flowers imbricated ; bluish-purple ; leaflets lanceolate, silky ; stipulas half-arrow-shaped, mostly entire. *Tufted Vetch*.

Hab. Rough boggy fields, and in hedges, where it is very ornamental. July, Aug. ʒ

* * *Flowers axillary, nearly sessile.*

3. *V. sativa*, flowers mostly in pairs, purplish ; leaflets elliptic-oblong, lower ones abrupt ; stipulas with a blackish depression beneath ; seeds orbicular, smooth. *Common Vetch*.

Hab. Corn fields, and dry short pastures. Banks below

Marshall-meadows. Amongst the whins to the north of Kylvoe rocks. June. ☉

Our plant is the variety β of the English Flora, and the specimens from the latter station approach, in some characters, to the *V. angustifolia* of the same work. The flowers are always solitary, very conspicuous and beautiful, but bluish-purple, not crimson. The root is furnished with a few fleshy, rather large tubercles; the stems are procumbent, but branched and downy, not simple and smooth; and the mark of the stipulas is generally pale, but sometimes brown. Readily distinguished from the following by the seeds.

4. *V. lathyroides*, flowers solitary, bluish-purple; leaflets elliptic-oblong, lower ones inversely heart-shaped; tendrils simple, shorter than the leaflets; seeds cubic, warty. *Spring Vetch*.

Hab. Gravelly fields. "Heugh, Holy Island;" Chapel-hill, Belford, and other basaltic heights between it and Bamborough, Thomp. May. ☉

5. *V. sepium*, flowers about 4 together, in short axillary clusters, bluish-purple; legumes upright, smooth; leaflets ovate, obtuse, the upper ones gradually smaller. *Bush Vetch*.

Hab. Hedges, common. We have observed it with white flowers. June. ♀

222. ERVUM.

1. *E. hirsutum*, clusters many-flowered; flowers very small, pale blue; legumes hairy, with 2 seeds; stems weak, straggling; leaflets linear-oblong, abrupt. *Hairy Tare*.

Hab. Corn fields and cultivated ground. June—Aug. ☉

223. ASTRAGALUS.

1. *A. glycyphyllos*, stem prostrate, 2 or 3 feet long; leaves longer than the flower-stalks; leaflets oval; flowers pale sulphur-colour; legumes obscurely triangular, incurved. *Wild Liquorice*.

Hab. "Brow of Cockle-hill at Learmonth; banks of Tweed by the road to Carham; Hilly pastures at Monney-Laws," Wallis. June. ♀

2. *A. hypoglottis*, stem prostrate, 2 to 5 inches long; flowers in

round heads, bluish-purple; legumes ovate, deeply channelled along the back, compressed, hairy, hooked at the point; leaflets blunt. *Purple Milk-vetch.*

Hab. Links of Holy Island, Winch. Spittal Links, and the links beyond Scrammerston, Thomp. Sea banks below Redheugh, Berwickshire. June, July. 7/

224. TRIFOLIUM.

* *Flowers in clusters. Seeds 1 or more.*

1. *T. officinale*, stem erect; leaflets obovate, oblong, toothed; stipulas awl-shaped; flowers unilateral, drooping; legume prominent, acute, transversely wrinkled, hairy, with 2 seeds. *Common Melilot.*

Hab. Bushy places and way sides. "Old limestone quarry at Saterpath Haven," Thomp. Sea-banks in several places. New-water Haugh Wood. July. ☉

The flowers are commonly yellow, but in this neighbourhood, more frequently of a greenish-white colour, and smaller than usual. The herb is very palatable food to all sorts of cattle, and has a grateful odour when cut down and dried. Its seed is of all others the most pernicious in wheat, a few communicating a very strong smell to the flour.—SINCLAIR. It is fortunately rare in this district.

* * *Flowers capitate. Seeds several.*

2. *T. repens*, stems creeping, solid; flowers somewhat stalked, white, in a globose head; legume within the calyx, 4-seeded. *White Clover, or Shamrock.*

Hab. Meadows and pastures. May—Sept. 7/

It is a curious fact, and one not easily explained, that whenever a moor or barren heath is manured or turned up with the spade or plough, instead of producing next season its former coarse grass or heath, the white clover uniformly appears in their place, although previously it was at least not visible to the eye.

In dry soils the flowers sometimes become leafy. This we have observed on Holy Island. The flowers are supported on rather long stalks; the calyx has 6 leaflike cut segments, while the style is dilated into a large ovate leaf,

toothed on the margins. In other respects the plant is not altered, and cannot deceive the student under this disguise, however it may interest him.

* * * *Flowers capitate. Seeds single.*

3. *T. pratense*, spikes dense ; stems ascending ; petals unequal ; calyx hairy, 4 of its teeth equal ; stipulas ovate, bristle-pointed. *Common Purple Clover.*

Hab. Meadows and pastures. May—Sept. 2

The “Cow-grass” of farmers, who seem very unwilling to admit that their “Purple Clover” can be a variety produced by cultivation, as is generally supposed by botanists, seeing that the former is perennial, while the latter is biennial only, and their agricultural properties are very different. This, however, is very good for cattle, and very noisome to witches. And, in the days when there were witches in the land, the leaf was worn by knight and by peasant, as a potent charm against their wiles ; and we can even yet trace this belief of its magic virtue in some not unobserved customs. Hast thou never sought, and deemed thyself fortunate in finding a four-leaved clover ?

“ But woe to the wight who meets the green knight
Except on his faulchion arm
Spell proof he bear, like the brave St Clair,
The *holy Trefoil's* charm ;
For then shall fly his gifted eye
Delusions false and dim ;
And each unblest'd shade shall stand pourtray'd
In ghostly form and limb.”

4. *T. medium*, spikes lax ; stems zigzag and branching ; petals nearly equal ; calyx smooth, 2 upper teeth rather the shortest ; stipulas tapering, converging. *Zigzag Trefoil.*

Hab. In deans. Longridge dean. July. 2

The characters which best distinguish this from the preceding, seem to be the shape of the stipulas, and the smooth calyx. The heads of flowers are also somewhat globular, concave on the top, and of a finer purple. The character afforded by the comparative length of the lower tooth of the calyx, and of the tube of the corolla, adopted by WILLDENOW, and borrowed by HOOKER and GREVILLE, is not to be depended upon, since in *this* we find the tooth sometimes much shorter than the tube, while in the *cultivated clover* it is often equal to it in length.

5. *T. arvense*, spikes cylindrical, very hairy; stipulas lanceolate, bristle-pointed; calyx-teeth longer than the corolla, permanently bristle-pointed; leaflets linear-obovate; stem erect, much branched. *Hare's-foot Trefoil*.

Hab. Sandy barren fields. Heugh, Holy Island. Chapel-hill, Belford, and heights between it and Bamboorough. Bed of Wooler Water, Thomp. "Banks of the eye opposite Netherbyres," Rev. A. Baird. July, Aug. ☉

6. *T. scabrum*, heads sessile, axillary, ovate; calyx-teeth unequal, lanceolate, rigid, finally recurved; stems procumbent, rigid. *Rough Trefoil*.

Hab. Rocks in Holy Island, Winch. June. ☉

7. *T. striatum*, heads sessile, axillary and terminal, ovate; calyx elliptical, furrowed, hairy, with straight bristle-shaped teeth; stems procumbent, pubescent. *Soft-knotted Trefoil*.

Hab. Dry pastures. On rocks at Holy Island. Heights from Kyloe to Bamboorough. June. ☉

* * * * Standards persistent, dry and membranous. Flowers yellow.

8. *T. procumbens*, heads oval, many-flowered; standard finally deflexed, furrowed; stems spreading or procumbent; common footstalk longest at the base. *Hop Trefoil*.

Hab. Dry gravelly fields. June, July. ☉

9. *T. minus*, heads hemispherical, with 12-15 flowers; flower-stalks straight, rigid; standard nearly even; stems prostrate; common footstalk very short. *Lesser Trefoil*.

Hab. Dry gravelly fields. June, July. ☉

225. LOTUS.

1. *L. corniculatus*, stems recumbent, pithy; heads depressed, of 2-5 yellow flowers; claw of the standard obovate; filaments all dilated; legumes spreading, nearly cylindrical. *Common Bird's-foot Trefoil*.

Hab. Grassy pastures, common. June—Sept. 2/

2. *L. major*, stems erect, tubular; heads depressed, many-flowered, duller yellow; claw of the standard linear; shorter filaments not dilated; legumes drooping, cylindrical. *Greater Bird's-foot Trefoil*.

Hab. Bushy places at the sides of ditches, frequent.
July, Aug. 7/

226. MEDICAGO.

1. *M. sativa*, stem erect, smooth; leaflets long, serrated towards the end; clusters upright, of many bluish-purple flowers; legumes spiral. *Lucerne*.

Hab. Field above the quarry on Sunnyside, Dr Thompson. "Corn-field near Gunsgreen-hill," Rev. A. Baird.
Aug. Sept. 7/

Lucerne has often been recommended for fodder, but is not cultivated in this neighbourhood. At Portobello, near Edinburgh, it is cultivated with great success; and the appearance of the field is always particularly fresh and luxuriant.

2. *M. lupulina*, stem procumbent; leaflets obovate; spikes ovate, erect, of numerous small yellow flowers; legumes kidney-shaped, rugged and veiny, single-seeded. *Black Medick*.

Hab. Meadows and pastures. May—Aug. ☉

The *Yellow Clover* of the farmer, and often sown with ryegrass.

CLASS XVIII.

POLYADELPHIA.

“ The young maid stole thro’ the cottage door,
 And blush’d as she sought the plant of pow’r ;—
 “ Thou silver glow-worm, O, lend me thy light,
 I must gather the mystic St John’s-wort to-night,
 The wonderful herb whose leaf will decide
 If the coming year shall make me a bride.”

And the glow-worm came
 With its silvery flame,
 And sparkled and shone
 Thro’ the night of St John,
 And soon has the young maid her love-knot tied.

With noiseless tread
 To her chamber she sped,
 Where the spectral moon her white beams shed :—
 “ Bloom here—bloom here, thou plant of pow’r
 To deck the young bride in her bridal hour !”
 But it droop’d its head that plant of pow’r,
 And died the mute death of the voiceless flow’r ;
 And a wither’d wreath on the ground it lay,
 More meet for a burial than bridal day.

And when a year was past away,
 All pale in her bier the young maid lay !
 And the glow-worm came
 With its silvery flame,
 And sparkl’d and shone
 Thro’ the night of St John
 As they closed the cold grave o’er the maid’s cold clay.”

I. POLYANDRIA.

227. **HYPERICUM.** *Calyx* inferior, in 5 deep divisions; *petals* 5; *filaments* united at the base, into 3 or 5 parcels; *capsule* with many seeds.

In former times the *Hypericum*, or St John's-wort, was looked upon as a "plant of power" in the expulsion of demons, in hindering witches of their will, and in prognosticating the good or bad fortune of young men and maidens, as to their obtaining partners for life. In Lower Saxony the young girls, to this day, gather sprigs of it on Midsummer night, and fasten them to the walls of their bed-chamber. If, on the ensuing morning, the sprig remains fresh, a suitor may be expected; if it drop or wither, the maid is destined to an early grave. This superstition gave origin to the beautiful lines we have selected for our motto, and which are taken from Blackwood's Magazine for January 1821.—The *H. perforatum* is the species which was used in this country; and the belief in its virtues is said still to linger amongst the people of North Wales.

227. HYPERICUM.

1. *H. quadrangulum*, stem herbaceous, with 4 sharp angles; leaves ovate, with copious pellucid dots; segments of the calyx lanceolate; flowers lemon-coloured, paniced; styles 3. *Square St John's-wort.*

Hab. Moist meadows, and banks of rivulets. July. 74

2. *H. perforatum*, stem two-edged; leaves elliptical, obtuse, with copious pellucid dots; segments of the calyx lanceolate; flowers bright yellow, streaked; styles 3. *Perforated St John's-wort.*

Hab. Thickets and hedges, frequent. July, Aug. 74

3. *H. humifusum*, stem compressed, prostrate; leaves elliptical, smooth; segments of the calyx ovate, leafy; flowers somewhat cymose, yellow; styles 3. *Trailing St John's-wort.*

168 POLYADELPHIA—POLYANDRIA.

Hab. Gravelly pastures. Hilly pastures above Lamberton Shields; "Fields about Netherbyres," Rev. A. Baird. In fields above Ayton, on the Eye; and near St Abb's Head. July. 2/

—————"Far diffus'd
And lowly creeping, modest and yet fair,
Like virtue, thriving most where little seen."

4. *H. hirsutum*, downy; stem erect, round; leaves ovate; calyx lanceolate with glandular serratures; flowers yellow; styles 3. *Hairy St John's-wort.*

Hab. Woods not common. Sea banks at Lamberton Shields; Tweed banks beyond Ord-Mill, Thomp. July. 2/

5. *H. pulchrum*, smooth; stem erect, round; leaves clasping the stem, heart-shaped; calyx ovate, with glandular serratures; flowers yellow, tipped with scarlet; styles 3. *Pretty St John's-wort.*

Hab. Deans and bushy places, common. July. 2/

CLASS XIX.

SYNGENESIA.

“ Many of the Sciences are evidently pursued, and considered as proper objects of study for all refined minds, merely on account of the intellectual pleasure they afford ; merely because they enlarge our views of nature, and enable us to think more correctly with regard to the beings and objects surrounding us.”—Sir H. DAVY.

I. POLYGAMIA ÆQUALIS.

* *Corolla of each floret ligulate.*

236. **HYPOCHÆRIS.** *Receptacle* chaffy ; *seed* down feathery ; *calyx* somewhat imbricated.
238. **CICHORIUM.** *Receptacle* slightly chaffy ; *down* chaffy, shorter than the seed ; *calyx* double.
235. **CREPIS.** *Receptacle* roughish ; *down* simple, partly stalked ; *calyx* double, outermost lax, tumid, deciduous.
234. **HIERACIUM.** *Receptacle* almost naked, dotted ; *down* simple, sessile ; *calyx* imbricated, ovate.
233. **APARGIA.** *Receptacle* naked, dotted ; *down* feathery, sessile, unequal and various ; *calyx* double, innermost imbricated.

229. **PICRIS.** *Receptacle* naked ; *down* feathery ; *seeds* furrowed transversely ; *calyx* double, innermost equal, outer lax.
228. **TRAGOPOGON.** *Receptacle* naked ; *down* stalked, feathery ; *calyx* simple, of several equal scales, in 2 rows.
232. **LEONTODON.** *Receptacle* naked ; *down* stalked, simple ; *calyx* imbricated, double, scales of the outermost lax.
231. **LACTUCA.** *Receptacle* naked ; *down* stalked, simple ; *calyx* imbricated, simple, cylindrical, scales membranous at the margin.
230. **SONCHUS.** *Receptacle* naked ; *down* sessile, simple ; *calyx* simple, imbricated, swelling at the base.
237. **LAPSANA.** *Receptacle* naked ; *down* none ; *calyx* double, innermost of equal channelled scales.

* * *Florets all tubular, lax, and spreading in the limb. Capitulate.*

243. **CARLINA.** *Calyx* swelling, outer scales spinous, inner coloured, polished, radiant ; *receptacle* chaffy ; *down* feathery.
239. **ARCTIUM.** *Calyx* globose, scales spinous, hooked, inflexed.
240. **CARDUUS.** *Calyx* tumid, imbricated, scales spinous ; *receptacle* hairy ; *down* deciduous, capillary, roughish.
241. **CNICUS.** *Calyx* tumid, imbricated, scales spinous ; *receptacle* hairy ; *down* deciduous, feathery.
242. **ONOPORDUM.** *Calyx* tumid, scales spinous, spreading ; *receptacle* cellular, somewhat chaffy.

* * * *Florets all tubular, parallel, crowded, nearly on a level at the top. Discoid.*

244. **EUPATORIUM.** *Receptacle* naked ; *down* rough ; *calyx* imbricated, oblong ; *style* cloven half-way down, prominent.

II. POLYGAMIA SUPERFLUA.

* *Corolla of the marginal florets obsolete, or wanting. Discoid.*

245. **TANACETUM.** *Receptacle* naked; *seed* with a membranous crown; *calyx* imbricated, hemispherical; *florets* of the circumference 3-cleft, obsolete, sometimes wanting.
247. **GNAPHALIUM.** *Receptacle* naked; *down* rough, or feathery; *calyx* imbricated, scales filmy, coloured; *florets* of the circumference awl-shaped.
246. **ARTEMISIA.** *Receptacle* either naked or hairy; *down* none; *calyx* imbricated, scales rounded, converging; *florets* of the circumference awl-shaped, entire.

* * *Corolla of the marginal florets ligulate. Radiant.*

254. **BELLIS.** *Receptacle* naked, conical; *down* none; *calyx* hemispherical, scales equal; *seed* obovate.
255. **CHRYSANTHEMUM.** *Receptacle* naked, rather convex; *down* none: *calyx* hemispherical, imbricated, scales with a dilated membranous border.
256. **PYRETHRUM.** *Receptacle* naked; *seed* crowned with a border; *calyx* hemispherical, imbricated, scales rather acute, membranous at the edges.
253. **INULA.** *Receptacle* naked; *down* simple; *calyx* imbricated; *florets* of the radius very numerous, linear; *anthers* with 2 bristles at the base.
248. **ERIGERON.** *Receptacle* naked; *down* simple; *calyx* imbricated; *florets* of the radius numerous, linear, very narrow; *anthers* simple.
252. **SOLIDAGO.** *Receptacle* naked, pitted; *down* simple; *calyx* imbricated, with close scales; *florets* of the radius about 5.

251. **ASTER.** *Receptacle* naked ; *down* simple ; *calyx* imbricated, lowermost scales spreading ; *florets* of the radius more than 10.
250. **SENECIO.** *Receptacle* naked ; *down* simple : *calyx* double, the innermost cylindrical, of numerous equal scales, outer of several minute ones, scales all withered at the extremity.
249. **TUSSILAGO.** *Receptacle* naked ; *down* simple ; *calyx* simple, tumid at the base, scales numerous, equal, somewhat membranous ; *seed* obovate, compressed.
257. **ANTHEMIS.** *Receptacle* chaffy ; *seed* crowned with a slight border ; *calyx* hemispherical, scales nearly equal ; *florets* of the radius numerous, oblong.
258. **ACHILLEA.** *Receptacle* chaffy ; *down* none ; *calyx* ovate, scales imbricated, unequal ; *florets* of the radius 5–10, roundish, somewhat heart-shaped.

III. POLYGAMIA FRUSTRANEA.

259. **CENTAUREA.** *Receptacle* bristly ; *down* simple or feathery, rarely wanting ; *florets* of the radius funnel-shaped, dilated, irregular, without stamens or style.

I. POLYGAMIA ÆQUALIS.

228. TRAGOPOGON.

1. *T. pratensis*, smooth, milky ; leaves keeled, tapering, dilated, and somewhat undulated at the base ; flower-stalk cylindrical ; calyx about equal to the corolla. *Yellow Goat's-beard.*

Hab. Meadows and pastures, frequent. June. ♂

We find the segments of the calyx uniformly much longer than the corolla. If the weather be fair, the large yellow

flowers open at the rising of the sun, and close again between nine and ten o'clock in the morning, so that they are seldom seen expanded. The roots "boyled in water until they be tender, and buttered as parseneps and carrots, are a most pleasant and wholesome meate, in delicate taste farre surpassing either parsenep or carrot; which meate procures appetite, warmeth the stomacke, prevailleth greatly in consumptions, and strengthneth those that have been sicke of a long lingring disease."—GERARDE.

229. PICRIS.

1. *P. echiioides*, herb very bristly; leaves wavy; outer calyx of 5 broad heart-shaped scales; flowers golden yellow; down stalked. *Bristly Ox-tongue*.

Hab. By the Pier-road near the Limekiln, Thomp.—Probably its most northern station, as it has not yet found a place in the Scottish Flora. July. ☉

230. SONCHUS.

1. *S. arvensis*, root creeping; stem 3 or 4 feet high; leaves runcinate, finely toothed, heart-shaped at the base; flower-stalks and calyx bristly, somewhat umbellate; flowers large, yellow. *Corn Sow-thistle*.

Hab. Corn fields, common. Aug. ♀

5. *S. oleraceus*, leaves runcinate, toothed; flower-stalks cottony; calyx smooth; flowers pale yellow, rather small. *Common Sow-thistle*.

Hab. Waste grounds. July—Sept. ☉

231. LACTUCA.

1. *L. virosa*, leaves horizontal, finely toothed, the keel prickly. *Strong-scented Lettuce*.

Hab. Near Twizel Castle; lane west of Old Ladykirk, Mr W. Baird. Banks of the Tweed from the Chain-bridge to Norham, most abundant. Ayton road, near the six-mile stone. Twizel Toll. Aug. Sept. ♂

Root tapering. Stem from 4 to 8 feet high, round, reddish-purple, prickly before flowering, but afterwards nearly

smooth. Leaves all cauline, large, alternate, obovate, obtuse, tapered towards the base, sinuated and spinous on the margin, with red midrib and veins, which are prickly on the inferior surface. The upper leaves become gradually smaller, more decidedly clasp the stem, are sometimes pinnatifid, and prickly only on the midrib and margins. The upper surface of the leaves is dull green, smooth, but the under is often purplish, and the midrib and veins always so. Flowers in a large erect panicle, rather small, yellow. Calyx-scales more or less tinged with purple, the upper ones downy at the tip, indistinctly keeled. This description differs something from that of other authors; and the fig. of GERARDE, No. 3. were the leaves less sinuated, would better express our plant than the fig. No. 1. usually quoted.

The whole herb abounds in a milky juice, which has the smell of opium, and possesses narcotic and diuretic properties.

232. LEONTODON.

1. *L. Taraxacum*, outer scales of the calyx reflexed; leaves runcinate, toothed, smooth. *Common Dandelion*.

Hab. Pastures, &c. April—July. ʒ

Early in spring the leaves, before they are fully expanded, might be used in sallads, especially if they were blanched. When a swarm of locusts had destroyed the harvest in the island of Minorca, many of the inhabitants subsisted upon this plant; and at Gottingen the roots are roasted, and used by the poor for coffee. It has been much recommended by BOERHAAVE and others, in diseases proceeding from obstructions in the liver; and is still held in estimation by some physicians of respectability. On their recommendation, we have occasionally prescribed both the extract, and a decoction of the recent herb, with much benefit.

2. *L. palustre*, outer scales of the calyx erect, shorter, imbricated, ovate; leaves sinuated and toothed, not quite smooth. *Marsh Dandelion*.

Hab. Boggy meadows, rare. "In a small marshy plantation on the farm of Gunsgreen," Rev. A. Baird. June, July. ʒ

233. APARGIA.

1. *A. hispida*, stalks naked, single-flowered; leaves runcinate, rough; flowers yellow; florets hairy at their orifice, glandular at the tip; seeds scarcely beaked, all with feathery down. *Rough Hawkbit*.

Hab. Meadows and pastures. July. ½

2. *A. autumnalis*, common stalk branched; partial ones scaly; leaves lanceolate, toothed or pinnatifid, nearly smooth; flowers yellow. *Autumnal Hawkbit*.

Hab. Meadows and pastures. Aug. ½

234. HIERACIUM.

* *Stalk radical, naked, single-flowered.*

1. *H. Pilosella*, leaves elliptical, entire, cottony beneath; scions creeping; stalks naked; flowers pale yellow, beautiful. *Mouse-ear Hawkweed*.

Hab. Dry banks and pastures. May—July. ½

* * *Stem leafy.*

2. *H. murorum*, stem corymbose with a solitary leaf; leaves ovate-heartshaped, wavy, with radiating teeth chiefly at the base; flowers rather large, yellow. *Wall Hawkweed*.

Hab. On the steep naked banks of the Tweed and Whiteadder, plentiful. On Kylvie rocks. June. ½

3. *H. sylvaticum*, stem simply racemose, many-leaved, solid; leaves ovate-lanceolate, toothed chiefly about the base, teeth pointing forward; flowers yellow. *Wood Hawkweed*.

Hab. Old walls and dry banks. On the Old Castle. Banks between the Foundry and Spittal. July. ½

4. *H. paludosum*, stem angular, tubular, leafy, smooth, corymbose; leaves smooth, toothed, elliptic-oblong, clasping the stem with their heart-shaped base; calyx hairy; flowers yellow. *Marsh Hawkweed*.

Hab. Marshy places. Castle hills. Boggy ravine east of West Ord, &c. July. ½

5. *H. sabaudum*, stem erect, copiously leafy, many-flowered; leaves ovate-lanceolate, sharply toothed, rough-edged, somewhat clasping, hairy beneath; flowers yellow. *Shrubby Hawkweed.*

Hab. Bushy deans. Longridge dean. Sea banks between Marshall Meadows and Lamberton Shields. Aug. Sept. ½

6. *H. umbellatum*, stem erect, leafy, almost solid, imperfectly umbellate; leaves scattered, linear, slightly toothed, nearly smooth as well as the calyx. *Narrow-leaved Hawkweed.*

Hab. Bushy rocky places. Haiden dean, on the site of an old Roman station. Aug. Sept. ½

It is curious that in the greater number of the plants of this species, some insect deposits its egg near the summit, by which an oval or globular tumour is produced, and a more complete umbellate appearance given to the yellow flowers.

235. CREPIS.

1. *C. tectorum*, stem smooth, branched; radical leaves runcinate, the rest clasping, lanceolate and toothed; calyx rough; flowers small, yellow; seed-down sessile. *Smooth Hawk's-beard.*

Hab. Dry pastures, old walls and road-sides. July, Aug.



236. HYPOCHÆRIS.

1. *H. radicata*, stems branched, naked, smooth; leaves runcinate, bluntish, rough; flower-stalks scaly; flowers large, yellow; down of all the seeds stalked. *Long-rooted Cat's-ear.*

Hab. Pastures and waste ground. July. ½

237. LAPSANA.

1. *L. communis*, stem branched, paniced, leafy; leaves ovate, stalked, toothed; flower-stalks cylindrical, even; flowers very small, yellow; calyx of the fruit angular. *Common Nipple-wort.*

Hab. Waste and cultivated grounds. July, Aug. ⊙

238. CICHORIUM.

1. *C. Intybus*, stem 2 or 3 feet high, rough, very tough; leaves runcinate; flowers large, bright blue, in pairs, both sessile.

Wild Succory.

Hab. "Fields by the Tweed opposite Spring Gardens," Thomp., not now to be found there. Holywell-haugh at New Ladykirk, Mr W. Baird. (It was in this field that Edward I. met the Scottish nobility, to settle the dispute betwixt Baliol and Bruce, relative to the crown of Scotland.) July, Aug. ♀

In France the young leaves are used in salads; and the shoots from the root, blanched by being forced in a dark cellar, are much relished as a winter salad, under the name of *Barbe de Capucin*. The dried roots afford a powder, which Dr HOWISON thinks preferable to that of coffee; and Dr DUNCAN is of opinion, that the plant might be cultivated with great national advantages, as a substitute for that exotic berry. On the continent, Succory is cultivated to some extent for the use of milch cows, which, when fed on it, are said to yield generally about a third more milk than when on ordinary fodder; and it is also accounted excellent for promoting the production of butter.—See NEILL's *Hort. Tour*.

239. ARCTIUM.

1. *A. Lappa*, leaves stalked, heart-shaped, wavy, without prickles; calyx, when in seed, nearly smooth. *Common Burdock*.

Hab. Waste grounds. July, Aug. ♂

2. *A. Bardana*, leaves stalked, heart-shaped, nearly entire and even, without prickles; calyx, when in seed, cottony. *Woolly-headed Burdock*.

Hab. Waste grounds, more common, I think, than the preceding. July, Aug. ♂

The common people occasionally take a decoction of the roots of Burdock, in herpetic eruptions, and with success. It might be employed as a substitute for sarsaparilla. Sir R. WALPOLE has praised it much as a remedy in gout.

240. CARDUUS.

* *Leaves decurrent.*

1. *C. nutans*, 2 or 3 feet high, cottony; leaves interruptedly decurrent, spinous; flowers solitary, drooping, large, crimson, musky; calyx-scales lanceolate, their upper part spreading. *Musk Thistle.*

Hab. Waste grounds. "Shore near the Four-gun Battery," Thomp. July, Aug. ☉

2. *C. acanthoides*, 3 feet high, green; leaves decurrent, sinuated, very spinous; flowers aggregate, somewhat stalked, purple; calyx globose, scales linear, partly recurved. *Wetted Thistle.*

Hab. Hedges and dry waste ground, not uncommon. July. ☉

3. *C. tenuiflorus*, 3 or 4 feet high, cottony; leaves decurrent, sinuated, spinous; flowers aggregate, sessile, pale purple; calyx nearly cylindrical, scales ovate at the base, somewhat recurved at the point. *Slender-flowered Thistle.*

Hab. Waste places and road-sides, common in this neighbourhood. June, July. ☉

* * *Leaves sessile.*

4. *C. marianus*, leaves wavy, spinous, clasping the stem, radical ones pinnatifid, all painted with broad white veins; calyx-scales leafy, recurved, channelled, spinous at the margin; flowers solitary, large, purple. *Milk Thistle.*

Hab. Waste grounds, frequent. Bankhill, and other parts of the Ramparts. Castle banks. Holy Island, opposite St Cuthbert's, Thomp. July. ☉

" Proud Thistle! emblem dear to Scotland's sons!
 Begirt with threatening points, strong in defence,
 Unwilling to assault! By thee the arm
 Of England was repelled; the rash attempt
 Oft did the wounded arm of England rue.
 But fraud prevailed, where force had tried in vain:
 Fraud undermined thy root, and laid thy head,
 Thy crested head low sullied in the dust."

GRAHAME.

241. CNICUS.

* *Leaves decurrent. Stem winged.*

1. *C. lanceolatus*, stem furrowed, hairy ; leaves decurrent, pinnatifid, hispid, with variously spreading spinous lobes ; calyx ovate, shaggy ; flowers erect, large, crimson. *Spear Thistle.*

Hab. Way-sides frequent. July, Aug. ♂

3. *C. palustris*, very prickly, green, 3 or 4 feet high ; leaves decurrent, pinnatifid, toothed, spinous, rough ; flowers aggregate, sessile, purple or white, rather small ; calyx ovate, minutely spinous, nearly smooth. *Marsh Thistle.*

Hab. Moist meadows and shady places. July. ♂

* * *Leaves sessile, or partially decurrent. Stem not winged.*

3. *C. arvensis*, stem paniced, solid ; leaves sessile, pinnatifid, spinous, nearly smooth ; calyx ovate, outer scales spinous ; flowers stalked, pale purple ; root creeping, tuberous. *Creeping Thistle.*

Hab. Cultivated fields and way-sides. July. ♀

A very bad weed, which it seems quite impossible wholly to destroy by any exertions of tillage which are consistent with due attention to profit.

4. *C. heterophyllus*, stem downy, almost single-flowered ; leaves clasping the stem, fringed, undivided or pinnatifid, very smooth above, densely cottony beneath ; flower large, fine purple. *Melancholy Thistle.*

Hab. Moist mountainous pastures. "At the foot of Cheviot," Winch. July, Aug. ♀

242. ONOPORDUM.

1. *O. Acanthium*, cottony, 4 or 5 feet high ; leaves ovate-oblong, sinuated, woolly on both sides ; calyx-scales awl-shaped, spreading in every direction ; flowers solitary, large, bluish rose-colour. *Common Cotton-thistle.*

Hab. Waste grounds. "Wastes near the Scotch-gate,"
Thomp. Frequent in gardens and shrubberies. July.

♂

243. CARLINA.

1. *C. vulgaris*, a foot high; stem corymböse, many-flowered; flowers terminal, purplish; outer calyx-scales pinnatifid, inner whitish. *Carlina Thistle*.

Hab. Dry barren fields. Sea banks below Lamberton Shields, Thomp., and between them and Burnmouth. Holy Island, Mr Neill. June, July. ♂

"This genus was named after the Emperor CHARLEMAGNE, because, according to report, one of its species, *C. acaulis*, was pointed out to him by an angel, to cure his army of the plague. Its root is pungent, bitter, and tonic; but the large white everlasting flower is perhaps most useful, when nailed upon cottage doors, in Germany, France, or Italy, by way of a hygrometer, as it closes before rain."—SM.

244. EUPATORIUM.

1. *E. cannabinum*, stems 2 or 3 feet high, leafy, downy; leaves in 3 or 5 deep lanceolate segments, the middle one longest; flowers in dense, pale purplish, corymböse tufts. *Hemp-agrimony*.

Hab. Watery boggy places, frequent. Dodses' Well, and other parts of the sea-banks, Thomp. Horncliff dean, &c. Aug. ʒ

II. P. SUPERFLUA.

245. TANACETUM.

1. *T. vulgare*, leaves doubly pinnatifid, deeply serrated, naked; flowers densely corymböse, yellow. *Common Tansy*.

Hab. Banks of the Whiteadder, Tweed and Till, plentiful, Thomp. July, Aug. ʒ

"In the spring time are made with the leaues hereof newly sprung up, and with eggs, cakes or tansies, which be pleasant in taste, and good for the stomacke. For if any bad

humours cleave thereunto, it doth perfectly concoct them, and scowre them downewards. The root, preserued with hony or sugar, is an especial thing against the gout, if euery day, for a certaine space, a reasonable quantitie thereof be eaten fasting." GERARDE.—Tansy cakes and pudding, notwithstanding all this, are now much out of fashion.

246. ARTEMISIA.

1. *A. maritima*, herb hoary; leaves downy, pinnatifid, uppermost undivided; flowers drooping, oblong, downy, sessile; receptacle naked. *Sea Wormwood*.

Hab. Sea-shore in a muddy soil. Coast beyond Goswick; "on the Emblestones," Thomp. Aug. ʒ

A decoction of this plant is occasionally used by the people here as an anthelmintic.

2. *A. gallica*, leaves downy, pinnatifid, radical ones capillary, uppermost undivided; flowers erect, oblong, downy, partly stalked, of few florets; receptacle naked.

Hab. On St Cuthberts, Holy Island, sparingly. August, Sept. ʒ

3. *A. Absinthium*, herb hoary; leaves in many deep segments, clothed with close silky down; flowers drooping, hemispherical; receptacle hairy. *Common Wormwood*.

Hab. Waste ground about villages. Aug. ʒ

This and the following are in much use amongst the poor as bitter stomachic and deobstruent medicines; and they are frequently very useful. What our publicans sell under the name of Purl, is said to be ale seasoned with the tops of Wormwood—BRANDE; and, according to Mr NEILL, the distillers in Scotland sometimes employ it in place of hops. "The plant is thought to drive away insects from clothes and furniture, for which purpose it is often laid into drawers and chests in the country."

"While Wormwood hath seed, get a handful or twalne,
To save against March, to make flea to refraine.
Where chamber is sweeped, and wormwood is strown,
No flea for his life dare abide to be knowne."

4. *A. vulgaris*, leaves pinnatifid, flat, cut, downy beneath, dark green above; clusters simple; flowers ovate; receptacle naked. *Mugwort*.

Hab. Under hedges, and in waste places. Aug. 24

247. GNAPHALIUM.

* *Calyx white or reddish.*

1. *G. dioicum*, shoots procumbent; stem unbranched, 3 or 4 inches high; radical leaves obovate; flowers dioecious, in a simple terminal corymb; seed-down feathery, various. *Mountain Cudweed*.

Hab. Moors. "Etal Moor, by the road to the Coalworks," Wallis. Lamberton Moor. Moors above Kyle. June, July. 24

* * *Calyx brown, and less ornamental.*

2. *G. rectum*, stem simple, nearly erect, downy; leaves linear-lanceolate, naked on the upper side, silky beneath; flowers axillary, forming a distant leafy spike. *Upright Cudweed*.

Hab. Thickets and pastures on a sandy soil. Lamberton Moor. Quarry on Sunnyside, Thomp. Moor at Ord Hill. Road-side above Fenham, &c. Aug. 24

3. *G. uliginosum*, stem much branched, spreading, woolly; leaves linear-lanceolate, cottony on both sides; flowers in dense terminal tufts. *Marsh Cudweed*.

Hab. Sandy watery places, particularly where water has stood during winter, common. Aug. ☉

4. *G. minimum*, stem erect, branched; leaves lanceolate, acute, flat; flowers conical, in lateral and terminal tufts; herb somewhat cottony. *Least Cudweed*.

Hab. Sandy heaths and barren ground, common. July, Aug. ☉

5. *G. germanicum*, stem erect, proliferous; leaves lanceolate; heads globose, many-flowered, lateral as well as terminal; calyx-scales bristle-pointed. *Common Cudweed*.

Hab. Dry fields and pastures, common. July, Aug. ☉

248. ERIGERON.

1. *E. acris*, stem racemose; stalks mostly single-flowered; leaves lanceolate or tongue-shaped, sessile; radius erect, scarcely taller than the seed-down. *Blue Flea-bane*.

Hab. "Links at Holy Island in a direction north from the Castle, plentiful," Thomp. July, Aug. ♂

249. TUSSILAGO.

1. *T. Farfara*, stalks single-flowered, clothed with scaly bractees; flowers radiant, yellow; leaves heart-shaped, angular and toothed, cottony beneath. *Colt's-foot*.

Hab. Moist clay-soils common, one of the most injurious of weeds. March, April. ♀

The flowers come before the leaves. In the bud they are pendulous, erect when expanded and in vigour; when they begin to fade, they contract their petals together, and again hang their heads, lamenting, as it were, their departed beauty; but before long, the seeds being matured and ready to be dispersed, they rise again erect, that the breeze may waft them more certainly to a soil fitted for their germination in a future spring. I know not a more interesting proof that the actions of plants are not explicable on mechanical principles.

The downy substance, on the under surface of the leaves, impregnated with saltpetre, makes excellent tinder. A decoction of them in milk is a popular remedy in pectoral complaints.

2. *T. Petasites*, flowers flosculous, flesh-coloured, in a dense ovate-oblong panicle; leaves heart-shaped, unequally toothed, 3-ribbed at the base, larger than those of any other native plant. *Butter-bur*.

Hab. Moist meadows, and the banks of rivers. April, May. ♀

250. SENECIO.

* *Flowers without rays.*

1. *S. vulgaris*, leaves pinnatifid, toothed, obtuse, smoothish, clasping at the base; flowers dispersed, small, yellow. *Common Groundsel*.

Hab. Waste and cultivated grounds. Flowers at all seasons. ☉

Birds kept in cages are fed with the young buds and leaves, which have a saltish herbaceous flavour. Beat down into a coarse pulp, and applied to the pit of the stomach, they cause strong vomiting some hours after; and thus employed, have been found to cure the ague. *Edin. Med. Essays and Obs.* vol. ii. p. 42.—A poultice of the whole herb forms a good application to boils, and sprained joints.

* * *Flowers with speedily revolute rays.*

2. *S. viscosus*, stem with many spreading branches, downy; leaves pinnatifid, viscid; flowers yellow with revolute rays; outer calyx lax, almost as long as the inner. *Stinking Groundsel.*

Hab. Waste ground, rare. About the riding-stable at Easington plentiful. July—Oct. ☉

3. *S. sylvaticus*, stem erect, straight, corymbose; leaves sessile, pinnatifid, lobed and toothed; flowers yellow with revolute rays; outer calyx short, with bluntish discoloured tips. *Mountain Groundsel.*

Hab. Dry soils, banks and mounds of earth, common. July. ☉

* * * *Flowers with spreading rays.*

4. *S. tenuifolius*, stem erect, loosely cottony, straight; leaves pinnatifid, somewhat revolute, paler and shaggy beneath; flowers yellow with spreading oblong rays. *Hoary Ragwort.*

Hab. Woods, and by road-sides, rare. "Plantation on the banks of the Tweed near Ord-mill, sparingly," Thomp. Road-sides between Swinton and Swinton-mill, Berwickshire, Messrs A. and W. Baird, by whom it was first added to the Scottish Flora. July, Aug. 4

5. *S. Jacobæa*, stem erect, branched; leaves doubly pinnatifid, somewhat lyrate, with spreading toothed smooth segments; flowers yellow, with spreading, oblong, toothed rays; seeds of the disk silky. *Common Ragwort.*

Hab. Pastures and road-sides. July, Aug. 4

6. *S. aquaticus*, leaves lyrate, serrated, the lowermost obovate and undivided; flowers yellow, with spreading elliptic oblong rays; seeds all smooth. *Marsh Ragwort*.

Hab. Wet meadows and sides of ponds. July, Aug. 7

251. ASTER.

1. *A. Tripolium*, herbaceous, corymbose; leaves lanceolate, entire, fleshy, smooth, obscurely 3-ribbed; calyx-scales obtuse, somewhat membranous; flowers with a yellow disk and blue rays. *Sea Starwort*.

Hab. Salt marshes. Sides of the Tweed above the bridge; and coast beyond Goswick Links, plentiful. August, Sept. 7

252. SOLIDAGO.

1. *S. virgaurea*, stem slightly zigzag, angular, erect; lower leaves stalked, elliptic-oblong, those of the stem sessile, lanceolate, all partly serrated; clusters downy, paniced, crowded, erect; flowers yellow. *Common Golden-rod*.

Hab. Deans frequent. New-mill banks. Murton Craigs, *Thomp. Longridge and Haiden deans, &c. July—Sept. 7

253. INULA.

1. *I. dysenterica*, stem woolly, paniced, a foot high; leaves oblong, downy, clasping the stem with their heart-shaped base; calyx-scales bristle-shaped, hairy; flowers yellow, rather large. *Common Flea-bane*.

Hab. Watery places, rather rare. Dodses' Well; "Porter-haugh;" Castle-hill banks, Thomp. In the latter station it was abundant in 1822, and flowered freely: in 1823 it did not flower, and it has since entirely disappeared, though no change has been made in the field. "Holywell-haugh, near Ladykirk," Mr W. Baird. Aug. 7

The *Doronicum Pardalianches*, GERARDE says, "hath beene found and gathered in the cold mountaines of Northumberland, by Dr PENNY, lately of London, deceased, a man of much experience and knowledge in simples;" but we are not aware of its having been seen by any one since.

254. BELLIS.

1. *B. perennis*, root creeping; flower-stalks radical, naked.
Common Daisy.

Hab. “ ’Tis Flora’s page:—in every place,
 In every season fresh and fair,
 It opens with perennial grace,
 And blossoms every where.

On waste and woodland, rock, and plain,
 Its humble buds unheeded rise;
 The Rose has but a summer reign,
 The Daisy never dies.”

This little flower has ever been the favourite of poets, a distinction which it seems to merit by the beauty and purity of its blossoms, which, in May particularly, are evolved in such profusion as to whiten the fields, and render the landscape doubly cheerful. In the days of chivalry it was the emblem of fidelity in love, and was frequently borne at tournaments both by ladies and by knights. Thus DRYDEN, from CHAUCER, in the *Vision of the “Flower and the Leaf:”*

“ A tuft of Daisies on a flowery lay
 They saw, and thitherward they bent their way;
 To this both knights and dames their homage made,
 And due obeisance to the Daisy paid.
 And then the band of flutes began to play,
 To which a lady sung a virelay:
 And still at every close she would repeat
 The burden of the song, ‘ The Daisy is so sweet.’
 ‘ The Daisy is so sweet,’ when she begun,
 The troop of knights and dames continued on.”

And thus LEYDEN, in a passage of exquisite beauty :

“ Star of the mead! sweet daughter of the day,
 Whose opening flower invites the morning ray,
 From thy moist cheek, and bosom’s chilly fold,
 To kiss the tears of eve, the dew-drops cold!
 Sweet Daisy, flower of love! when birds are paired,
 ’Tis sweet to see thee, with thy bosom bared,

Smiling, in virgin innocence, serene,
 Thy pearly crown above thy vest of green.*
 The lark, with sparkling eye, and rustling wing,
 Rejoins his widowed mate in early spring,
 And as she prunes his plumes, of russet hue,
 Swears, on thy maiden blossom, to be true.
 "Oft have I watched thy closing buds at eve,
 Which for the parting sun-beams seemed to grieve,
 And, when gay morning gilt the dew-bright plain,
 Seen them unclasp their folded leaves again:
 Nor he who sung—'the Daisy is so sweet,'—
 More dearly loved thy pearly form to greet;
 When on his scarf the knight the Daisy bound,
 And dames at tourneys shone, with daisies crown'd,
 And fays forsook the purer fields above,
 To hail the Daisy, flower of faithful love."

255. CHRYSANTHEMUM.

1. *C. Leucanthemum*, stem erect, 1 or 2 feet high; leaves clasping the stem, oblong, obtuse, cut, pinnatifid at the base, radical ones obovate stalked; flowers large, solitary, with a yellow disk and white rays. *White Ox-eye*.

Hab. Dry pastures and way-sides. Some of the fields in the vicinity of Barmoor Castle are white with it. June, July. 7/

2. *C. segetum*, smooth, glaucous; leaves clasping the stem, jagged upwards, toothed at the base; flowers large, yellow. *Yellow Ox-eye*.

Hab. Corn-fields, a "splendid weed," but very rare in this neighbourhood. "Fields below Lamberton," Thomp. Near Gunsreen House, Rev. A. Baird. Fields near St Abb's-head. June—Aug. ☉

* I question whether any but a botanist will fully appreciate the beauty of this line; and the same remark might with propriety have been made on some other passages which we have quoted, particularly on that very beautiful one from SHAKESPEARE, under *Primula veris*. MICHAELIS has remarked, that "the frequent recurrence for metaphorical expressions to natural objects, and particularly to plants and to trees, is so characteristic of the Hebrew poetry, that it might be almost called the *botanical* poetry." A similar designation might not unaptly characterize the poetry of the present day;—we have at least found the pleasure of reading it much enhanced by an acquaintance with natural history.

256. PYRETHRUM.

1. *P. Parthenium*, stem erect, 2 feet high; leaves stalked, compound, flat; leaflets ovate, cut, the uppermost confluent; flower-stalks corymbose; rays white, shorter than the diameter of the yellow disk. *Common Fever-few.*

Hab. Waste ground, and about hedges. "About New-water-haugh," Thomp. Old walls near Eyemouth, Rev. A. Baird. Near Twizel Toll. July. ♂

2. *P. inodorum*, stem branched, spreading; leaves sessile, pinnate, in numerous capillary pointed segments; flowers large, solitary, white; crown of the seeds entire. *Horse-gowan.*

Hab. Fields and road-sides very common. Aug.—Oct. ☉

3. *P. maritimum*, stems diffuse; leaves sessile, doubly pinnate, fleshy, pointless, convex above, keeled beneath; flowers large, white; crown of the seeds lobed. *Sea Feverfew.*

Hab. Sea-banks about the Needle-eye, Thomp., but in almost inaccessible places. July, Aug. ♀

257. ANTHEMIS.

1. *A. arvensis*, stem much branched, hairy; leaves doubly pinnatifid, hairy, segments parallel; flowers white; receptacle conical, scales lanceolate, acute, keeled, prominent; seeds crowned with a quadrangular border. *Corn Chamomile.*

Hab. Road-sides in various places, but nowhere plentiful.

"By the old tower near the Magdalen-field Farm-house," Thomp. Near Cheswick Buildings; and near the Inn on Doddington Moor. July. ♂

The *A. Cotula* is mentioned as a common weed by Messrs BAILLEY and CULLEY in their Agricultural Survey of Northumberland; and, from the Botanist's Guide, it would appear to be far from rare either in that county or in Durham,—but we have not seen it within the limits we have assigned to ourselves.

258. ACHILLEA.

1. *A. Ptarmica*, leaves linear, pointed, equally and sharply serrated, smooth; flowers white, corymbose. *Sneeze-wort*.

Hab. Moist meadows and pastures, most common on a moorish soil. July, Aug. 7/

2. *A. Millefolium*, stem furrowed; leaves doubly pinnatifid, hairy, segments linear, toothed, pointed; flowers small, white or rose colour, in a dense flattish corymb. *Common Yarrow*.

Hab. Pastures and way-sides. June—Aug. 7/

A useful plant in pastures, but too common to require to be sown. The root is warm and agreeably pungent, partaking of the flavour and salivating quality of the Pellitory of Spain. An infusion of the flowering tops was once a celebrated stomachic, but is now neglected, except by the good women of Orkney, who use it as tea, and hold it in estimation for its virtue in dispelling melancholy.

III. FRUSTRANEA.

259. CENTAUREA.

1. *C. nigra*, lower leaves somewhat lyrate, with angular lobes, upper ones ovate; calyx black, its scales oval, fringed with upright capillary teeth; flowers discoid, crimson; seed-down very short, tufted. *Black Knapweed*.

Hab. Pastures and road-sides. July, Aug. 7/

2. *C. Cyanus*, leaves linear-lanceolate, entire, lower ones toothed towards their base; calyx-scales serrated; flowers sky-blue. *Corn Blue-bottle*, or *Blawort*.

Hab. Corn-fields not uncommon. July, Aug. ☉

“The wild flowers afford a blue for painting in water-colours, the expressed juice requiring only to be mixed with cold alum-water.”—SM. “As blue as a *Blaver*,” was once a familiar comparison in the Merse, now intelligible to few.

CLASS XX.
GYNANDRIA.

——“ For him, the Spring
Distils her dews, and from the silken gem
Its lucid leaves unfolds: for him, the hand
Of Autumn tinges every fertile branch
With blooming gold, and blushes like the morn.
Each passing hour sheds tribute from her wings;
And still new beauties meet his lonely walk,
And loves unfelt attract him.——

—— Nor thence partakes
Fresh pleasure only: for the attentive mind,
By this harmonious action on her powers,
Becomes herself harmonious: wont so oft
In outward things to meditate the charm
Of sacred order, soon she seeks at home
To find a kindred order, to exert
Within herself this elegance of love,
This fair inspir'd delight: her temper'd powers
Refine at length, and every passion wears
A chaster, milder, more attractive mein.”

AKENSIDE.

I. MONANDRIA.

* *Anther of 2 distinct vertical cells, fixed to the summit of the column.*

260. ORCHIS. *Nectary with a spur behind.*

* * *Anther parallel to the stigma, of 2 cells close together, permanent.*

261. *LISTERA*. *Calyx* spreading; *nectary* without a spur, nearly flat; *petals* spreading; *column* without wings.

* * * *Anther terminal, fixed.*

262. *EPIPACTIS*. *Nectary* without a spur, tumid underneath at the base, contracted in the middle, undivided at the end.

I. MONANDRIA.

260. ORCHIS.

* *Knobs of the root roundish, undivided.*

1. *O. bifolia*, leaves usually 2, elliptical; knobs of the root oval, taper-pointed; lip of the nectary lanceolate, entire, about half the length of its very long spur; lateral calyx-leaves spreading downwards. *Butterfly Orchis*.

Hab. Marshy places, and also on heaths. Bogs below Shoreswood, and on Ancroft Moor, sparingly, Dr Thompson. Doddington Moor, at the 13 mile-stone, plentiful. Coldingham Moor. June. 4

The flowers are in a long loose spike, yellowish-white, and in the evening exhale the scent of the sweetest honeysuckle. I have gathered a curious specimen, in which the nectary had 2 spurs and 2 lips of the usual size and length, 4 calyx leaves, and petals unusually elongated, while the germen contained 4 capsules.

2. *O. mascula*, knobs of the root oval; lip of the nectary 4-cleft, crenate, spur obtuse; calyx-leaves 3-ribbed, 2 lateral ones reflexed upwards. *Early Purple Orchis*.

Hab. Pastures frequent. Very abundant on our sea-banks. May. 4

Salep is prepared principally from the roots of this species. For the manner of its culture and preparation, I must refer to Dr HUNTER's *Georgical Essays*, York, 1777, and

to WITHERING's Botany. The leaves are generally spotted with black, but we have frequently observed them entirely green. The flowers are purple, and are believed to be the "Long-purples" of SHAKSPEARE, with which poor OPHELIA formed her fantastic garlands.

" There is a willow grows ascaunt the brook,
That shows his hoar leaves in the glassy stream;
Therewith fantastick garlands did she make
Of crow-flowers, nettles, daisies, and Long-purples,
That liberal shepherds give a grosser name,
But our cold maids do Deadmen's fingers call them."

* * *Knobs of the root palmate.*

3. *O. latifolia*, stem hollow; leaves unspotted; knobs imperfectly palmate; lip of the nectary convex, crenate, slightly 3-cleft, spur conical; bractees longer than the flowers. *Marsh Orchis*.

Hab. Marshes and moist meadows, common. June. 2/

4. *O. maculata*, knobs palmate, spreading; lip of the nectary flat, crenate, 3-lobed, spur cylindrical, rather shorter than the germen; bractees shorter than the flowers. *Spotted Orchis*.

Hab. Meadows and pastures, common. July. 2/

Leaves spotted with black. Flowers pale purple or white, streaked with dark lines. We have examined numerous specimens, and uniformly find the bractees *longer* than the germens, green with crimson edges. The anthers are yellowish, as well as the pollen, and, when touched at the base of the filaments, readily separate, and adhere to the needle, as much, perhaps, from their irritability, as from their glutinous quality.

5. *O. conopsea*, knobs palmate; lip of the nectary in 3 entire equal lobes, spur very slender, twice as long as the germen; calyx widely spreading. *Aromatic Orchis*.

Hab. Moist meadows and pastures, not uncommon. "In a marshy field near Edington Moor, Berwickshire," Rev. A. Baird. Castle hills, in the field adjoining Spring-gardens. Sea-banks at Hudshead. Longridge dean, &c. July. 2/

The flowers are rather small, of an uniform crimson colour, and exhale a delicious odour, resembling that of a Clove Pink. We have observed the spikes sometimes entirely without flowers, bearing bractees only.

261. LISTERA.

1. *L. ovata*, stem with only a pair of elliptical opposite leaves ; flowers yellowish-green, numerous ; nectary with 2 linear-oblong nearly parallel lobes ; column with a posterior hood. *Common Twayblade*.

Hab. Moist pastures, not uncommon. Haiden dean. Woods below Claribed Mill, Dr Thompson. Boggy ground at the four mile-stone on the Ayton road. June, July. ½

2. *L. cordata*, stem with only 2 heart-shaped opposite leaves ; flowers greenish-brown, small, scarcely more than 10 ; nectary with 4 lobes. *Heart-leaved Twayblade*.

Hab. " Buncle Wood," Berwickshire, Rev. A. Baird. July, Aug. ½

3. *L. Nidus-avis*, leaves none ; stem clothed with sheathing scales ; flowers pale brown, in a many-flowered cylindrical cluster ; nectary with 2 spreading lobes. *Bird's-Nest Listera*.

Hab. Woods at Netherbyres, Berwickshire, Rev. A. Baird. May, June. ½

262. EPIPACTIS.

1. *E. palustris*, leaves lanceolate, clasping the stem ; flowers drooping, large, white tinged with purple ; lip rounded, obtuse, crenate, as long as the petals, with a notched protuberance on the disk. *Marsh Helleborine*.

Hab. Rough boggy places. Haiden dean. Field below the Old Lamberton Toll. In the Pond field above Spindleston. July. ½

CLASS XXI. MONŒCIA.

“ He looks abroad into the varied field
Of Nature, and, though poor, perhaps, compared
With those whose mansions glitter in his sight,
Calls the delightful scenery all his own.
His are the mountains, and the valleys his,
And the resplendent rivers.”

COWPER.

I. MONANDRIA.

263. **EUPHORBIA.** *Involucrum* with numerous barren flowers, and 1 fertile. **BARREN FLOWER**—*calyx* none; *corolla* none. **FERTILE FLOWER**—*calyx* none; *corolla* none; *capsule* 3-lobed; *styles* 3, cloven.
264. **ZANNICHELLIA.** *Involucrum* none. **BARREN FLOWER**—*calyx* none; *corolla* none. **FERTILE FLOWER**—*calyx* of 1 leaf; *corolla* none; *germens* 4, or more; *seeds* 4, stalked; *stigmas* peltate. (Aquatic.)

II. TRIANDRIA.

266. **SPARGANIUM.** **BARREN FLOWER**—*calyx* 3-leaved; *corolla* none. **FERTILE FLOWER**—*calyx* 3-leaved; *corolla* none; *drupe* dry. (Flowers in round balls.)

267. **CAREX.** BARREN FLOWER—*catkin* imbricated ; *calyx* a scale ; *corolla* none. FERTILE FLOWER—*catkin* imbricated ; *calyx* a scale ; *corolla* a hollow permanent *glume*, investing the loose seed. (Grass-like.)
265. **TYPHA.** BARREN FLOWER—*catkin* hairy ; *calyx* none ; *corolla* none ; *anthers* about 3 on each filament. FERTILE FLOWER—*catkin* hairy ; *seed* 1, on a hairy stalk. (Reed-like.)

III. TETRANDRIA.

268. **LITTORELLA.** BARREN FLOWER—*calyx* 4-leaved ; *corolla* 4-cleft ; *stamens* capillary, very long. FERTILE FLOWER—*calyx* none ; *corolla* unequally 3 or 4-cleft ; *style* very long ; *nut* of 1 cell.
270. **URTICA.** BARREN FLOWER—*calyx* 4-leaved ; *petals* none ; *nectary* central, cup-shaped ; *stamens* the length of the calyx. FERTILE FLOWER—*calyx* 2-leaved ; *corolla* none ; *seed* 1, superior, polished.
269. **ALNUS.** BARREN FLOWER—*calyx* scale of a catkin, permanent, 3-flowered ; *corolla* deeply 4-cleft. FERTILE FLOWER—*calyx* scale of a catkin, permanent, 2-flowered ; *corolla* none ; *styles* 2 ; *nut* compressed, without wings.

IV. POLYANDRIA.

271. **MYRIOPHYLLUM.** BARREN FLOWER—*calyx* 4-leaved ; *petals* 4 ; *stamens* 8. FERTILE FLOWER—*calyx* 4-leaved ; *petals* 4 ; *stigmas* 4, sessile ; *drupas* 4. (Aquatic.)
273. **POTERIUM.** BARREN FLOWER—*calyx* 3-leaved ; *corolla* deeply 4-cleft ; *stamens* 30–50. FERTILE FLOWER—*calyx* 3-leaved ; *corolla* deeply 4-cleft ; *pistils* 1 or 2 ; *nut* coated, of 1 or 2 cells.
275. **FAGUS.** BARREN FLOWER in a catkin ; *calyx* in several segments ; *corolla* none ; *stamens* 5–20. FERTILE FLOWER—*calyx* double, outer inferior, prickly, in several deep seg-

ments, 2 or 3-flowered, *inner* superior, 5 or 6-cleft; *corolla* none; *styles* 5 or 6; *nuts* 2 or 3, loosely invested with the spreading outer calyx.

274. **QUERCUS.** BARREN FLOWER in a *catkin*; *calyx* in several segments; *corolla* none; *stamens* 8, or more. FERTILE FLOWER—*calyx* double, *outer* inferior, scaly, undivided, *inner* superior, in 6 deep segments; *corolla* none; *style* 1; *nut* solitary, closely invested at its base with the hemispherical outer calyx.

277. **CORYLUS.** BARREN FLOWER in a *catkin*; *calyx* a 3-cleft scale; *corolla* none; *stamens* 8, or more. FERTILE FLOWER—*calyx* double, *outer* inferior, divided, *inner* superior, obsolete; *corolla* none; *styles* 2; *nut* solitary, bony, invested with the enlarged coriaceous jagged outer calyx.

276. **BETULA.** BARREN FLOWER in a *catkin*; *calyx* a ternate scale; *corolla* none; *stamens* 10–12. FERTILE FLOWER in a *catkin*; *calyx* a peltate, 3-lobed, 3-flowered scale; *corolla* none; *styles* 2; *nut* winged, deciduous.

272. **ARUM.** *Common calyx* a sheathing leaf inclosing a common stalk naked above; *corolla* none. BARREN FLOWER—*stamens* numerous, in a dense ring, surmounted by another ring of abortive *filaments*. FERTILE FLOWER—*germens* numerous, in a dense ring below the stamens, sessile; *styles* none; *stigmas* downy; *berry* with several seeds.

I. MONANDRIA.

263. EUPHORBIA.

1. *E. Peplus*, umbel 3-branched, forked; bractees ovate; leaves obovate, stalked, entire; nectaries crescent-shaped; seeds dotted. *Petty Spurge*.

Hab. Cultivated grounds. July, Aug. ☉

2. *E. exigua*, umbel 3-branched, forked; bractæ lanceolate; leaves linear; nectaries horned; seeds wrinkled. *Dwarf Spurge*.

Hab. Gravelly or sandy places, rare. Road-side at the Inn below Mountholy, plentiful. Aug. ☉

3. *E. helioscopia*, umbel of 5 three-cleft, then forked branches; bractæ and leaves obovate, serrated; nectaries 4, undivided; capsule smooth. *Sun Spurge*.

Hab. Cultivated grounds. July, Aug. ☉

The Euphorbiæ are full of a milky juice, which is commonly used to remove warts. It is very acrid, and there is on record the case of a boy, who was poisoned by eating some of the fresh herb.

264. ZANNICHELLIA.

1. *Z. palustris*, stem filiform, branched; leaves linear, entire, grass-like; flowers axillary, in pairs; anther of 4 cells; stigmas entire; capsules tubercular at the outer edge. *Horned-pond-weed*.

Hab. Ditches at the mouth of the Whiteadder. Pond at Scremerston lime-kilns. Ditches near Windmill-hill. Aug. ☉

II. TRIANDRIA.

265. TYPHA.

1. *T. latifolia*, leaves linear, somewhat convex beneath; catkin continuous; receptacle hairy. *Great Reed-mace*, or *Cat's-tail*.

Hab. Ponds and ditches, rare. Grange Burn (in the mill-pond); North Fluve, near Goswick, plentiful, Thomp. Near Eddencraw, Berwickshire. July. ♀

The stems rise about 6 feet high, and are terminated by a long cylindrical club, of a dark-brown colour, and velvety feel;—and this semblance of a mace is, on some festival occasions, in Italy put into the hand of statues of Christ, being considered as the reed with which the soldiers handed him the sponge of vinegar.

266. SPARGANIUM.

1. *S. ramosum*, leaves triangular at the base, with concave sides; common flower-stalk branched; stigma linear. (Stem 2 or 3 feet high; leaves sword-shaped.) *Branched Bur-reed*.

Hab. Ditches and ponds. July, Aug. ʒ

2. *S. simplex*, leaves triangular at the base with flat sides; common flower-stalk simple; stigma linear. (Less than the preceding.) *Unbranched Bur-reed*.

Hab. Sides of the Lough on Holy Island, sparingly; more plentiful in the pond above Spindleston. July, Aug. ʒ

267. CAREX.

* *Catkin solitary, simple.*

1. *C. dioica*, catkins simple, dioecious; fruit ovate, ribbed, ascending, finely serrated at the edges; root creeping. (Stem a span high, smoothish.)

Hab. Spongy bogs, common. Castle hills, &c. May, June. ʒ

2. *C. pulicaris*, catkin simple, florets in the upper half barren, in the lower fertile; fruit spreading, deflexed, polished, tapering at each end; stigmas 2. (Stem a span high, smooth.)

Hab. Bogs frequent. Castle hills. Boggy field below the Old Lamberton Toll. Lamberton Moor. Long-ridge dean, &c. June. ʒ

* * *Catkins or spikelets aggregate, each composed of barren and fertile florets. Stigmas 2.*

3. *C. stellulata*, spikelets 3 or 4, roundish, slightly distant; barren florets inferior; fruit spreading, with a tapering undivided beak. (Stem 6–12 inches high, triangular.)

Hab. Marshes in heathy places, common. May, June. ʒ

4. *C. curta*, spikelets about 6, elliptical, slightly distant, scarcely bracteated; scales ovate, membranous, about as long as the

ovate, tumid, smooth fruit. (Stem a foot high; spikelets silvery-white.)

Hab. Bogs, common in this neighbourhood. Lamberton Moor. Bog below Shoreswood. Felkington Bog, &c. June. 7/

5. *C. ovalis*, spikelets about 6, oval, crowded, alternate, with a bractea under the lowermost; fruit lanceolate, rough-edged, striated, nearly entire, the length of the lanceolate acute scales. (Stem 12-18 inches high. Spikelets greenish-brown.)

Hab. Marshy places. Yarrow-haugh; Doddington Moor, &c. June. 7/

6. *C. remota*, spikelets several, solitary, simple, remote, nearly sessile; bracteas very long, overtopping the stem; fruit ovate, with a slightly cloven beak. (A foot high, slender.)

Hab. Moist shady places on the banks of Wooler Water, below Langley-ford. June. 7/

7. *C. arenaria*, spikelets numerous, crowded into an oblong spike, upper ones chiefly of barren, lower of fertile florets; bracteas membranous, lower ones leafy; stem triangular; leaves flat; fruit winged. (8-12 inches high.)

Hab. Sandy sea-shore abundant, by its long spreading roots binding the sand together, which would otherwise be gradually, but certainly, carried towards the interior, covering up the fertile plains with its sterile particles, and rendering them unfit for the habitation of mankind. June. 7/

8. *C. intermedia*, spikelets numerous, crowded into an oblong dense spike, the lowermost and terminal ones fertile, intermediate ones barren; stem upright, triangular (12-18 inches high.)

Hab. Marshy watery meadows, frequent. Castle hills, &c. June. 7/

9. *C. vulpina*, spike thrice compound, dense, obtuse; fruit spreading, with a notched rough-edged beak; scales pointed; angles of the stem compressed, very sharp. (1-2 feet, firm; spike large, greenish.)

Hab. Watery places. Sides of the river from the Old Castle to New-water Haugh, sparingly. Plentiful at the sides of the pond at Goswick, &c. June. 7/

10. *C. paniculata*, spike thrice compound, loosely paniced, interrupted, acute; fruit spreading, with an abrupt serrated beak; stem sharply triangular, with flat interstices (2 or 3 feet high.)

Hab. Spongy bogs, forming large dense tufts. Haiden and Allerton-mill deans. June. 2/

* * * *Barren and fertile florets in separate catkins; the barren catkin solitary, very rarely more than one. Bractees leafy, often sheathing.*

11. *C. pendula*, sheaths nearly as long as the flower-stalks; fertile catkins very long, cylindrical, drooping; fruit densely crowded, ovate, beaked. (Stem 4 feet high, triangular; leaves large and harsh.)

Hab. "Sea-banks below Lamberton Shields, plentiful," Thomp. June. 2/

12. *C. sylvatica*, sheaths not half the length of the flower-stalks; catkins slender, rather loose, drooping; fruit ovate, triangular, beaked, without ribs. (Bright green; stem 12-18 inches high, slender, smooth, triangular.)

Hab. Wooded banks of Wooler Water, below Langleyford. June. 2/

LINNÆUS, when speaking of the means adopted by the Laplanders to protect themselves from arctic cold, says, "Calceis indunt gramen hocce, tempore æstivo dissectum, exsiccatum, brevi ante pectine ferreo vel corneo divisum, conquassatum inter manus, ita ut non modo tibias, sed et plantas pedum undique superius et inferius tegat, quo gramine velati liberi omnino sunt ab omni frigoris sævitia: Hocce etiam gramine chirothecas suas hirsutas replent, ne manus lædantur, sicque perdurat gens hæc gelu indurata. Uti gramen hoc hyeme frigus abigit, sic etiam æstate sudorem pedum areet, simulque ne pedes lædantur allisi ad lapides, &c. (calcei enim tenuissimi, non e corio sed pellibus conficiuntur) in itinere vetat."

13. *C. limosa*, sheaths scarcely any; fertile catkins ovate, dense, drooping, many-flowered; fruit elliptical, compressed, ribbed, smooth-edged, without a beak; root creeping. (Stem 8-10 inches high. Leaves linear, narrow.)

Hab. Bogs very rare. Haiden dean, sparingly. July. 2/

14. *C. pallescens*, sheaths very short ; fertile catkins cylindrical, stalked, at length pendulous ; fruit obovate, triangular, inflated, smooth, obtuse, with a minute abrupt beak. (Stem 1 foot high, rather slender. Leaves narrow, hairy on the inferior surface and sheaths.)

Hab. Wooded banks of Wooler Water below Langley-ford.
June. ¼

15. *C. flava*, sheaths short, nearly equal to the flower-stalks ; fertile catkins roundish-ovate ; fruit triangular, smooth, with a cloven beak curved downward ; stem nearly smooth, (9 to 12 inches high, triangular.)

Hab. Boggy meadows, frequent. June. ¼

16. *C. binervis*, sheaths tubular, elongated, shorter than the flower-stalks ; fertile catkins cylindrical, distant, partly compound ; scales pointed ; stem smooth ; fruit with 2 principal ribs. (Stem 12–18 inches high, bluntly triangular.)

Hab. Plentiful on all our moors. June. ¼

17. *C. præcox*, sheaths about equal to the very short flower-stalks ; catkins all elliptical, rather crowded ; scales of the fertile ones pointed ; fruit pear-shaped, downy, with an abrupt entire point. (Stem a span high, smooth.)

Hab. Dry pastures and heaths. April, May. ¼

18. *C. pilulifera*, sheaths none ; fertile catkins 2 or 3, sessile, crowded, almost globular, with pointed scales ; fruit triangular, roundish, downy, with a short cloven beak. (Stems from 6 to 12 inches long, slender, often curved.)

Hab. Moorish ground not common. Lamberton Moor ;
Murton Craigs. May. ¼

19. *C. panicea*, sheaths elongated, about half the length of the flower-stalks ; fertile catkins 1 or 2, distant, lower one rather lax ; fruit tumid, smooth, cloven at the summit ; stem smooth, obtusely triangular (about a foot high ; leaves glaucous.)

Hab. Meadows and moist pastures, common. May,
June. ¼

20. *C. recurva*, sheaths short ; fertile catkins 2 or 3, cylindrical, dense, drooping, on very long recurved stalks ; fruit elliptical, triangular, roughish, obtuse, slightly notched. (Stem from 8 to 18 inches high, smooth.)

Hab. Moist meadows, and wet heathy ground, common, and conspicuous from the glaucous green of its herbage, which, as Sir J. Smith well observes, much resembles the foliage of pinks or carnations. May, June. 7/

21. *C. rigida*, stigmas 2 ; sheaths none ; fertile catkins ovate, the lowermost stalked ; bractees lanceolate, recurved, as well as the leaves ; fruit triangular, somewhat compressed, with a short abrupt beak.

Hab. Summit of Cheviot, plentiful, Winch. June, July. 7/

22. *C. cæspitosa*, stigmas 2 ; sheaths none ; fertile catkins cylindrical, obtuse, erect, the lowermost rarely stalked ; leaves and auricled bractees linear, erect ; fruit permanent, elliptical, flat, many-ribbed, with a very short abrupt beak.

Hab. Marshes common. June. 7/

Stems from 6 to 12 inches high, triangular. Catkins scarcely an inch long.—Our specimens were submitted to Mr WINCH, and they certainly belong to this species, yet in one instance only have we seen it growing in a distinct cespitose manner. In general, it has as little of that character as any other species, so that the name is apt to occasion doubt in the mind of the student. SMITH says the fertile catkins are almost invariably 3, but in many of our specimens there are 2 only, sometimes 1 ; and there are frequently 2 barren catkins, which, according to SMITH, is a rare occurrence. In one specimen, besides the 2 barren catkins, there is another composed of both fertile and barren flowers.

*** Barren and fertile florets in separate catkins. Barren catkins 2 or more.

23. *C. acuta*, stigmas 2 ; catkins cylindrical, slender, drooping in flower, afterwards erect ; fruit elliptical, with a blunt undivided beak. (Stem 2 feet high, triangular, rough ; bractees without sheaths, leafy, long ; catkins 1½ or 2 inches long.)

Hab. Sides of the Tweed from West Ord to the Chain-

bridge plentiful, and in some places not more than 2 or 3 inches high. May. 7/

24. *C. paludosa*, stigmas 3; catkins cylindrical, bluntish, erect, the fertile ones with taper-pointed scales; fruit ovate, triangular, compressed, with a notched beak. (Stem 2 feet high, acutely triangular, rough; leaves broad; bractees very long, foliaceous, without sheaths.)

Hab. Boggy meadows and banks of ditches frequent. May. 7/

25. *C. lœvigata*, catkins cylindrical, barren one solitary, fertile ones stalked; scales all pointed; sheaths very long; fruit triangular, with a cloven beak. (Bright green, smooth, 2 feet high.)

Hab. Wooded banks of Wooler Water below Langleyford. June. 7/

26. *C. ampullacea*, fertile catkins cylindrical, elongated, nearly sessile; scales all lanceolate, acute; sheaths none; fruit inflated, globose, with a linear cloven beak. (1 or 2 feet high, somewhat glaucous.)

Hab. Bogs, common in this neighbourhood. Grangeburn mill-pond. Sides of the Whiteadder below the Bridge. Boggy field below the Old Lamberton toll. Lamberton Moor. Haiden dean, &c. June. 7/

27. *C. hirta*, herbage hairy; fertile catkins ovate-cylindrical, remote; scales awned; sheaths nearly as long as the flower-stalks; fruit hairy, tumid, with a deeply-cloven beak; stem rough-edged, (2 feet high.)

Hab. Wet meadows and watery places frequent. June. 7/

III. TETRANDRIA.

268. LITTORELLA.

1. *L. lacustris*, stemless; leaves linear, fleshy, semicylindrical, about 2 inches long; barren flowers on simple stalks, 2 or 3 inches high, with very long filaments; fertile flowers sessile. *Plantain Shore-weed*.

Hab. Margins of the Lough on Holy Island abundant. Coldingham Lough? June. ♀

269. ALNUS.

1. *A. glutinosa*, leaves roundish-wedge-shaped, wavy, serrated, glutinous, rather abrupt, downy at the branching of the veins beneath. *Common Alder*.

Hab. Wet and boggy grounds. May. ♂

The bark and leaves of this common and unattractive tree are employed in dyeing, in tanning leather, and for staining fishermen's nets, their astringent quality adapting them for these uses. The value of the bark is also well known to our calico-printers; and it might be used to great advantage as an excellent substitute for many woods used in dyeing, which we have from abroad, and on which we expend considerable sums. The wood is chiefly valuable from its property of remaining long sound under water; whence it is used for water-pipes, and for piles to be driven into the ground in order to support buildings in boggy situations. Clogs and pattens are also principally made of it; and with it the Highlanders are said to make chairs, which are very handsome, and have the colour of mahogany.

270. URTICA.

1. *U. urens*, leaves opposite, elliptical, with about 5 longitudinal ribs; clusters nearly simple. *Small Nettle*.

Hab. Waste places. June—Oct. ☉

2. *U. dioica*, leaves opposite, heart-shaped; clusters much branched, in pairs, mostly dioecious; roots creeping. *Great Nettle*.

Hab. Waste grounds. Aug. 24

The roots boiled with alum will dye yarn of a yellow colour; and with the juice of the herb woollen stuffs have been dyed a beautiful and permanent green. The fibres of the stem have been manufactured into cloth; and it appears, from some experiments made in Ireland, that the thread, in colour, strength, and fineness, is equal to that obtained from flax. In Scotland, the young tops are gathered in February, by the common people, as a pot-herb for soups, and their peculiar flavour is by many much esteemed. Of late it has been recommended for forcing. A strong decoction of nettles, with the addition of salt, will coagulate milk, as, says Mr LIGHTFOOT, we saw and experienced; but I have tried the experiment with no other result than the loss of my milk.

The Nettle is always found near the abodes of man. Wherever he has sojourned, it is said to have accompanied him; and it remains to take possession of his deserted dwellings, so that its presence has become associated with the ideas of ruin and desolation. "I went by the field of the slothful, and by the vineyard of the man void of understanding; and, lo, it was all grown over with thorns, and nettles had covered the face thereof, and the stone wall thereof was broken down."

IV. POLYANDRIA.

271. MYRIOPHYLLUM.

1. *M. spicatum*, stem round, branched, with numerous whorls of finely pectinated leaves, 4 in a whorl; flowers in whorled interrupted leafless spikes. *Spiked Water-Milfoil*.

Hab. In the Tweed and Whiteadder; in ponds and slow streams, common. July, Aug. 24

272. ARUM.

1. *A. maculatum*, stem none; leaves halbert-shaped, entire, spotted with black; common stalk of the flowers club-shaped, obtuse; berries scarlet. *Wake Robin*.

Hab. Shady places rare. Near Netherbyres, Rev. A. Baird.
May. 7/

The tuberous roots, when fresh, are acrid and dangerous; but, when dried, they afford a wholesome nutritious flour fit for making bread, and sold for that purpose in great abundance at Weymouth and in the Portland Island. This flour is sometimes called "Portland Sago;" and Dr WITHERING says, it forms also the "Cypress Powder," sold at a high price, and undoubtedly a good and an innocent cosmetic.

273. POTERIUM.

1. *P. Sanguisorba*, stem somewhat angular, thornless; leaves pinnate, leaflets rounded, serrated; flowers in round heads of a dull purplish colour. *Salad Burnet*.

Hab. Dry hilly pastures. On Spindlestone hills. July. 7/

The leaves taste and smell like Cucumber, and give that flavour to salads, for which purpose this plant is very generally cultivated; and did it now possess those virtues which were once attributed to it, no vegetable more deserved to be so; for, says GERARDE, "it is thought to make the heart merry and glad, as also being put into wine, to which it yeeldeth a certaine grace in the drinking."

274. QUERCUS.

1. *Q. Robur*, leaves deciduous, oblong, wider towards the extremity, their sinuses rather acute, lobes obtuse; fruit-stalks elongated. *British Oak*.

Hab. Woods and hedges. April.

The bark is extensively used in tanning leather; the wood is very hard and durable, fitted for many purposes, and invaluable as the material of which our ships of war are built; the saw-dust is the principal material used in dyeing fustians; the leaves are astringent; and on the acorns squirrels and other small quadrupeds subsist, and swine are fattened.

In this neighbourhood, though unquestionably a native of it, we have no trees which can give any idea of the size and beauty which the Oak frequently attains, and when it claims, as its undisputed right, to be the "Monarch of the wood." It has ever been a favourite with Britons. Under its shade, the Druids, the priests of his

ancestors, held their solemn festivals: in after centuries its timber supported and beautified the venerable cathedrals raised for a purer worship; the palaces of his princes rose on pilasters of oak, and it was the board of their festivities; but, above all, it is dear to him as the material of the “wooden walls” of his native isle. *Semper floreat!*

2. *Q. sessiliflora*, leaves on elongated stalks, deciduous, oblong, with opposite acute sinuses; fruit sessile. *Sessile-fruited Oak*.

Hab. In hedges; near West Fishwick, Berwickshire. April, May.

275. FAGUS.

1. *F. sylvatica*, leaves ovate, obsoletely serrated; prickles of the outer calyx simple; stigmas 3. *Common Beech*.

Hab. Woods, considered by Mr WINCH truly native; yet CÆSAR asserts there was, at the time of his invasion, no beech-timber in Britain. May.

A handsome tree, occasionally attaining the height of 90 feet, and having a stem 12 feet or more in girth. “Its leaves are of a pleasant green, and many of them remain on the trees during winter, after turning brown. No verdure, however, will thrive beneath its shade. The smoothness of its bark has from ancient times tempted the rural lover to carve the favourite name upon it, a custom recorded in various passages of the poets; and the opening of VIRGIL’s first eclogue represents the musing shepherd as reclining under the shade of a spreading beech.”

The wood is much used by the turner and cabinet-maker, and for various economical purposes. “The poets, who celebrate the simplicity and frugality of the early ages, speak much of the beechen cups and bowls, some of which received an extraordinary value from the hand of the carver.” The leaves, gathered in autumn, and somewhat before they are much frost-bitten, “afford the best and easiest mattresses in the world, to lay under our quilts, instead of straw; because, besides their tenderness and loose lying together, they continue sweet for seven or eight years long, before which straw becomes musty and hard. They are thus used by divers persons of quality in Dauphiné; and, in Switzerland, I have sometimes lain on them to my great refreshment: so as, of this tree, it may properly be said, “*Silva domus, cubilia frondes.*”—EVELYN.

276. BETULA.

1. *B. alba*, leaves ovate, acute, somewhat deltoid, unequally serrated, nearly smooth. *Common Birch.*

Hab. Woods and deans. May.

The Birch is a graceful airy tree, with a delicate and fragrant foliage; and the variety with pendulous branches is extremely pleasing and ornamental. "Birch may be said to be the universal wood of the Scots Highlanders. They make every thing of it; they build their houses of it, make their beds, chairs, tables, dishes, and spoons of it; construct their mills of it; make their carts, ploughs, harrows, gates and fences, of it; and even manufacture ropes of it!" Birch is also used in many other parts of the country in machinery, turnery, wheel-work, and for lasts, pattens, wooden shoes, and such purposes. It is likewise much used in collieries for props, and waggon-road sleepers. It is an excellent fuel, burning very clear, and emitting less smoke than most other woods. In the smoking of herrings, in particular, Birch is preferred to all other kinds of wood." NICHOLS.—The bark affords a tan inferior only to that of the oak: of the twigs besoms and rods are made; "the one for the cleanly housewife to sweep down the cobwebs, and the other for the magisterial pedagogue to drive the colt out of the man:" and the sap, in spring, is fermented into a kind of wine.

—"Even afflictive Birch,
Cursed by unlettered, idle youth, distils
A limpid current from her wounded bark,
Profuse of nursing sap."

277. CORYLUS.

1. *C. Avellana*, stipulas ovate, obtuse; leaves roundish, heart-shaped, pointed, serrated; young branches hairy; calyx shorter than the nut. *Hazel-Nut.*

Hab. Woods and deans. March, April.

* Its economical uses in Russia, and in other northern countries, are not less numerous and important. It is to their inhabitants what the Beech is said to have been to the people of the silver age:

"Hinc olim juvenis mundi melioribus annis,
Fortunatarum domuum non magna supellex
Tota petebatur; sellas, armaria, lectos,
Et mensas dabat, et lances, et pocula Fagus."

The charcoal of Hazel is preferred by painters and engravers, for the freedom with which it draws, and the readiness with which its marks can be rubbed out. The rods are cut to form walking-sticks, stakes, hurdles and baskets; and the "divining rod" of DOUSTERSWIVEL was always a hazel. Attracted by the effluvia from the metals concealed beneath the soil, it turned in obedience, and indicated their presence to the sage! Even within these few years it has been very positively affirmed that the rod, when held in the hands of *certain* persons, will discover the presence of water; and it is remarked as extraordinary, that no effect is produced at a well or ditch, or where earth does not interpose between the twig and the water. See *Quarterly Review*, vol. xxii. p. 373-4.—The Highlander's belief in the efficacy of two nuts naturally conjoined as a charm against witchcraft, ought not to be laughed at.

Our Scotch Fir (*Pinus sylvestris*) is not a native, but was brought from Canada not more than half a century ago. It is very inferior, in every respect, to the real Highland Fir, which may be found in the north of Scotland in immense natural forests, equally distinguished for their romantic beauty and national importance. This last is a noble tree, growing with huge contorted arms, not altogether unlike the Oak, and forming therein a strong contrast to the formality of the common fir.—Sir W. SCOTT in *Quart. Review*, vol. xxxvi. p. 580.

ST PIERRE has an observation somewhat connected with our subject, and so curious, and, we believe, correct, that we shall here introduce it. He says, he never saw the Ivy on the trunks of Pines, Firs, or of other trees whose foliage lasts the whole year round. It invests those only which are stripped by the hand of Winter; and when its protector has fallen a prey to death, it restores to him again the honours of the forest, where he lives no longer.

CLASS XXII.

DICÆCIA.

“ To name the uses of the Willow tribes
Were endless task. The basket's various forms
For various purposes of household thrift;
The wicker-chair of size and shape antique;
The rocking couch of sleeping infancy;
These, with unnumbered other forms and kinds,
Give bread to hands unfit for other work.”

GRAHAME.

I. DIANDRIA.

278. SALIX. BARREN FLOWER—*catkin* imbricated; *calyx* a scale; *petals* none; *nectary* 1 or more glands at the base; *stamens* 1-5. FERTILE FLOWER—*catkin* imbricated; *calyx* a scale; *petals* none; *nectary* as in the barren flower; *stigmas* 2; *capsule* superior, of 1 cell and 2 valves; *seeds* tufted.

II. TRIANDRIA.

279. EMPETRUM. BARREN FLOWER—*calyx* in 3 deep segments; *petals* 3; *stamens* capillary, 3-9. FERTILE FLOWER—*calyx* in 3 deep segments; *petals* 3; *stigmas* 9; *berry* superior, with 9 seeds,

III. TETRANDRIA.

280. MYRICA. BARREN FLOWERS in a catkin; *calyx* a concave scale; *corolla* none. FERTILE FLOWERS in a catkin; *calyx* a concave scale; *corolla* none; *styles* 2; *berry* superior, with 1 globular seed.

IV. OCTANDRIA.

- RHODIOLA. BARREN FLOWER—*calyx* in 4 deep segments; *petals* 4; *nectaries* 4, notched. FERTILE FLOWER—*calyx*, *petals* and *nectaries* the same; *pistils* 4; *capsules* 4, with many seeds.
281. POPULUS. BARREN FLOWER—*catkin* imbricated; *calyx* a torn scale; *corolla* turbinate, oblique, undivided. FERTILE FLOWER—*catkin*, *calyx* and *corolla* the same; *stigmas* 4 or 8; *capsule* superior, of 1 cell and 2 valves; *seeds* tufted.

V. ENNEANDRIA.

283. MERCURIALIS. BARREN FLOWER—*calyx* in 3 deep segments; *corolla* none; *stamens* 9–12; *anther* of 2 globose cells. FERTILE FLOWER—*calyx* the same; *corolla* none; *styles* 2; *capsule* of 2 lobes and 2 cells; *seeds* solitary.

VI. MONADELPHIA.

284. JUNIPERUS. BARREN FLOWER—*calyx* scales of a *catkin*; *corolla* none; *stamens* 3. FERTILE FLOWER—*calyx* scales of a *catkin*, fewer, finally pulpy, united into a *berry* with 3 seeds.
285. TAXUS. BARREN FLOWER—*calyx* none; *corolla* none; *anthers* peltate, lobed. FERTILE FLOWER—*calyx* cup-shaped, entire; *corolla* none; *style* 1; *seed* 1, enclosed in the enlarged pulpy unconnected *calyx*.

I. DIANDRIA.

278. SALIX.

▪ *Adult leaves serrated, smooth, or nearly so.*

1. *S. pentandra*, leaves ovate, pointed, crenate, glandular, smooth; footstalks glandular at the summit; stamens 5 or more, hairy at the base; germen ovate, tapering, smooth, nearly sessile. *Bay-leaved Willow.*

Hab. Boggy ground not uncommon. In the field below the Old Lamberton Toll. Allerton Mill dean. Haiden dean, &c. June, July.

In the dean below Allerton Mill there are some fine trees of this species, but commonly it is merely a bushy shrub, readily distinguished by the large broad shining green leaves, which exhale a fragrant bay-like scent from their resinous notches.

2. *S. decipiens*, leaves lanceolate, pointed, serrated, very smooth, floral ones partly obovate and recurved; footstalks somewhat glandular; germen tapering, stalked, smooth; style longer than the cloven stigmas; branches smooth, highly polished. *Varnished Willow.*

Hab. Sides of Grange-burn where it passes the road below Fairney-flat. May.

With us this is a bushy shrub, distinguished by its smooth varnished simple or slightly branched twigs, which are more or less coloured with brown. The leaves are narrow, tapered at each end, numerous, opposite or alternate, of a pleasant green. The barren catkins are upwards of an inch long, protruded before the leaves, and very beautiful. Stamens 2, at first united half-way up, but separating after shedding their pollen.

3. *S. Russelliana*, leaves lanceolate, tapering at each end, serrated throughout, very smooth; footstalks glandular or leafy; germen tapering, stalked, longer than the scales; style as long as the stigmas. *Bedford Willow.*

Hab. Woods and hedges, common in this neighbourhood.

New-water-haugh plantation, where there is a *barren* tree. Mouth of the Whiteadder, &c. April, May.

A large tree with smooth branches, and alternate leaves, which, when full grown, are about 5 inches long, and 1 broad in the middle, tapered at each end, and coarsely serrated throughout. The *barren* tree is very rare, and, if we are correct in our determination of it, the figure in **WITHERING** is not good. Its catkins are 2 inches long, cylindrical, yellow, diandrous, the filaments not much longer than the pointed, more or less villose, scales. They stand on short leafy branchlets; and these young leaves are entire, from 1 to 2 inches in length, but not otherwise different from the adult ones. Fertile catkins rather longer, lax, with smooth lanceolate germens.

This is "found the most profitable for cultivation of any species of the genus, for the value of its timber as well as bark, the rapidity of its growth, and the handsome aspect of the tree." The bark contains more of the tanning principle than any other tree in this country, except the Oak; and if contradictory accounts have been given of its value in tanning and in medicine, as a substitute for the *Cinchona*, these are probably to be attributed to the bark of different species having been indiscriminately employed.

The celebrated Willow near Lichfield, which goes by the name of the *Johnson Willow* (not that it was planted by the Doctor, but that his delight was to repose under its shade), proves to be *S. Russelliana*. The magnitude of this tree is truly surprising; the trunk, at six feet above the ground, measures 21 feet in girth, and extends 20 feet in height of that vast size before dividing into enormous ramifications. The whole trunk, thus comprising about 130 solid feet of timber, continues perfectly sound, and the very extensive head shews unimpaired vigour.—
Rev. S. DICKENSON, 1812.

4. *S. Helix*, branches erect; leaves partly opposite, oblong-lanceolate, pointed, slightly serrated, very smooth, linear towards the base; stamen 1; style nearly as long as the linear divided stigmas. *Rose Willow*.

Hab. Banks of rivulets. Sides of the Whiteadder between its mouth and the bridge. April.

"Branches upright, smooth and polished, of a pale yellowish or purplish ash-colour, tough and pliable." A bushy shrub, or tree, which withstands storms better than any other.

5. *S. Forbiana*, branches erect; leaves alternate, with small stipulas, lanceolate-oblong, with shallow serratures, smooth, rounded at the base, glaucous beneath; stamen 1; style nearly as long as the linear divided stigmas. *Basket Osier*.

Hab. Banks of Wooler Water, above Wooler. April.

A bushy shrub, "with upright, slender, smooth twigs, very flexible and tough, of a greyish yellow hue, highly esteemed, and much cultivated for the finer kinds of basket-work."

* * *Leaves all shaggy, woolly or silky.*

6. *S. argentea*, stem upright; leaves elliptical, entire, somewhat revolute, with a recurved point, rather downy above, silky and shining beneath, as well as the branches; germen ovate-lanceolate, silky, its silky stalk nearly equal to the linear-oblong scale; style not longer than the stigmas. *Silky Sand Willow*.

Hab. The sea-shore in loose sand. I have a specimen collected in this neighbourhood, but I have omitted to mark the station. May. ☉

The leaves are alternate, about an inch long, and half as much in breadth, covered underneath with close satin-like silky hairs, which give them a remarkably brilliant silvery appearance.

7. *S. prostrata*, stem prostrate, with elongated straight branches; leaves elliptic-oblong, convex, somewhat toothed, with a curved point, glaucous, silky and veiny beneath; stipulas minute; germen stalked, ovate, silky; style shorter than the stigmas. *Prostrate Willow*.

Hab. On heaths frequent. Murton craigs. Coldingham moor. In the bog at Mountfair, Berwickshire. April.

8. *S. repens*, stem depressed, with short upright branches; leaves elliptic-lanceolate, straight, somewhat pointed, nearly entire, almost naked above, glaucous and silky beneath; stipulas none; germen stalked, ovate, downy; capsules smooth. *Dwarf Willow*.

Hab. Bogs on heaths. Longridge dean, plentiful. May.

This and the preceding have been confidently pronounced varieties of the same species, by some botanists of de-

served eminence, while others not less eminent consider them "totally distinct." Both plants are familiar to me, and I cannot hesitate to rank myself with those who are of the latter opinion. *S. prostrata* is the larger species, sending up from its prostrate stem straight simple branches, a foot or more in length, which are clothed with alternate leaves, rather more than an inch long, and one-half as broad. *S. repens*, on the contrary, is a much branched creeping shrub, whose numerous branches scarcely rise above the grass. The leaves are more closely set, of a lighter green, and rarely one-half so large. A general dissimilarity in habit should surely keep plants separate, though they may agree in some minute characters.

9. *S. cinerea*, stem erect ; lower leaves entire, upper serrated, obovate-lanceolate, glaucous, downy, and reticulated with veins beneath ; stipulas half heart-shaped, serrated ; germen silky, its stalk half as long as the lanceolate scales *Grey Sallow*.

Hab. Moist woods and hedges. Road-side below Letham-shank, about two miles from Berwick. Allerton-mill dean. April.

A large shrub very much branched, the branches short, crooked, smooth, or downy. When cut over, it throws up straight shoots, with larger leaves and fewer catkins. These in general are very numerous, an inch long, coming before the leaves.

10. *S. aurita*, branches trailing ; leaves somewhat serrated, convex, obovate, obtuse, with a small hooked point, hairy, and reticulated with veins on both sides ; stipulas roundish, convex, toothed ; germen silky, stalked ; stigmas nearly sessile. *Round-eared Sallow*.

Hab. Deans frequent. Longridge dean, plentiful. Coast of Berwickshire in several places. April, May.

A bushy shrub usually 3 or 4 feet high, of a greyish colour, with short crooked branches. It is a very distinct species, well characterised by the form of the leaves, which, though sometimes very small, vary little in their shape. The dwarf variety, with small leaves, is frequent on moors in this neighbourhood.

11. *S. aquatica*, stem and branches erect ; leaves slightly serrated, obovate-elliptical, minutely downy, flat, rather glaucous

beneath ; stipulas rounded, toothed ; germen silky, stalked ; stigmas nearly sessile. *Water Sallow.*

Hab. Wet hedge-rows and woods. April.

A small tree or shrub, with a dull grey bark. The branches are very numerous, short and entangled, bearing a copious rough greenish-grey foliage, and in spring a profusion of catkins, which appear rather earlier than the leaves. Dr HOOKER makes it a variety of *S. cinerea*, from which it differs only in the size and form of the leaves ; for though SMITH describes the stigmas as entire, yet, according to the observation of Mr WINCH, they become divided after maturity, and agree in this respect also with the *cinerea*.

12. *S. oleifolia*, stem erect ; branches straight, spreading ; leaves obovate-lanceolate, flat, rather rigid, minutely toothed, acute, glaucous, reticulated and finely hairy beneath ; stipulas small, notched, rounded ; catkins oval, nearly half as broad as long. *Olive-leaved Sallow.*

Hab. In the boggy field below the Old Lamberton Toll. March, April.

Dr HOOKER and Mr WINCH are of opinion, that this also is a variety of *S. cinerea*. In the most characteristic specimens, the leaves are broader in proportion to the length than those of *S. cinerea*, and the fertile catkins are remarkable for their size, measuring sometimes not less than 3 inches ; but the leaves and catkins, even of the same specimen or shrub, differ much in their proportions and size, and its general habit is certainly similar to that of the *cinerea*. Fertile catkins from 1 to 3 inches long, cylindrical, straight, or curved, with a few minute scale-like bractes, evolved before the leaves. Scales obovate, blackish-brown, hairy, rather longer than the downy stalk of the germen. Germen tapered $\frac{1}{4}$ inch long, downy, green. Stigmas deeply divided, on a stalk equal to their own length.

13. *S. Andersoniana*, stem upright ; leaves elliptical, acute, finely notched, slightly downy, paler beneath ; stipulas half-ovate, nearly smooth ; branches minutely downy ; germen smooth, its stalk almost equal to the scale ; style cloven, longer than the cloven stigmas. *Green Sallow.*

Hab. In a hedge near Mount-Pleasant, Durham. April, May.

The leaves of this Willow are of a bright green on the upper surface, paler beneath, and only slightly downy.

14. *S. caprea*, stem erect ; leaves roundish-ovate, pointed, serrated, waved, pale and downy beneath ; stipulas somewhat crescent-shaped ; catkins oval ; germen stalked, ovate, silky ; stigmas nearly sessile, undivided ; capsules swelling. *Great Round-leaved Sallow.*

Hab. Woods and hedges. April.

This species is distinguished, in spring, by its numerous large oval yellow catkins, which appear before the leaves ; and afterwards by its very large rounded leaves, deep-green above, but underneath densely clothed with soft white cottony down, which gives them a considerable thickness. The flowering branches are called *Palms*, and are gathered by children about the time of Easter, the relics of a ceremony once performed in commemoration of our Saviour's entry into Jerusalem.

15. *S. acuminata*, stem erect ; leaves lanceolate-oblong, pointed, wavy, finely toothed, glaucous, and downy beneath ; stipulas half-ovate, then kidney-shaped ; catkins cylindrical ; germen stalked, ovate, hairy ; style as long as the undivided stigmas. *Long-leaved Sallow.*

Hab. Moist hedges. April.

I have given the specific character of this species unaltered, from SMITH, but it is proper to remark that our specimen was referred to it with a mark of doubt by Mr WINCH, and that does not altogether agree with the description.

16. *S. viminalis*, leaves linear, inclining to lanceolate, elongated, taper-pointed, entire, wavy, snow-white and silky beneath ; branches straight and slender ; germen sessile ; style as long as the linear undivided stigmas. *Common Osier.*

Hab. Wet places and banks of rivers. April, May.

17. *S. Smithiana*, leaves lanceolate, pointed, slightly wavy, minutely toothed, soft and scarce visibly downy above, whitish and silky beneath ; stipulas crescent-shaped, minute ; catkins ovate ; germen stalked ; style shorter than the linear deeply divided stigmas.

Hab. Hedges occasionally. In the garden at the Hope, and at Lethemshank. April, May.

From the remarks of Dr HOOKER, it would appear, that he is inclined to consider this a variety of the preceding, but the shrub we intend (and our specimen was named by Mr WINCH), is altogether different, and more nearly related to *S. caprea*, though very distinct from it. It is a small tree or shrub, with lanceolate leaves 3 inches long, fully one broad near the base, which, when the leaf has attained maturity, is rounded. The fertile catkins are small, numerous, greyish, and silky; the stigmas long and deeply divided, elevated on a style rather shorter than themselves.

18. *S. alba*, leaves elliptic-lanceolate, pointed, serrated, silky on both sides, the lowest serratures glandular; stamens hairy; germen smooth, almost sessile; stigmas deeply cloven; scales rounded. *Common White Willow.*

Hab. Woods frequent. May.

A large tree with a coarse rugged bark, and a copious foliage of a beautiful grey silvery appearance, which must have made it familiar to the most inattentive observers. The properties of the bark and wood are similar, but perhaps inferior to those of *S. Russelliana*; and the two trees have much the same general appearance. We have not observed a fertile tree in this neighbourhood.

II. TRIANDRIA.

279. EMPETRUM.

1. *E. nigrum*, stem and branches procumbent; leaves linear-oblong, revolute, evergreen; flowers axillary, bracteated, reddish; berry black. *Crow-berry.*

Hab. Moors very common; also on our sea-banks. May.
h

Mr NEILL saw at Deerness, in Orkney, very strong ropes, calculated for different purposes in husbandry, made of the shoots of this plant.

III. TETRANDRIA.

280. MYRICA.

1. *M. Gale*, stem shrubby, 3 or 4 feet high ; leaves lanceolate, serrated, tapering and entire at the base, besprinkled with resinous dots ; catkins axillary, with pointed scales. *Sweet Gale*.

Hab. Bogs and moorish ground, rare. I have omitted to mark the habitat of my specimen. Haiden dean ? May.
h

In Isla and Jura, and in Wales, the people lay branches of this shrub in their beds, and between their linen, to give them a fine scent, and drive away moths, for the leaves and berries, when bruised, exhale a fragrance from their resinous dots, delightful to our senses, but apparently very noisome to insects. In northern countries it was formerly used instead of hops ; and the cones boiled in water will yield a scum like bees wax, capable of being made into candles, similar to those which the Americans make of the berries of *M. cerifera*, or candle-berry myrtle.
LIGHTFOOT.

IV. OCTANDRIA.

281. POPULUS.

1. *P. alba*, leaves lobed and toothed, somewhat heart-shaped at the base, snow-white and densely downy beneath ; fertile catkins ovate ; stigmas 4. *White Poplar*.

Hab. In plantations frequent. March. h

2. *P. tremula*, leaves nearly orbicular, toothed, smooth on both sides, their stalks compressed ; young branches hairy ; stigmas 4, erect, auricled at the base. *Aspen*.

Hab. In woods frequent. March, April. h

The leaves are of a fine smooth dark green, with a narrow

yellowish edge more or less fringed with soft hairs, suspended on flattened stalks, so that

—“ when zephyrs wake,
The Aspen's trembling leaves must shake;”

and by their friction on one another they make a constant rustling noise, hence uncourteously feigned by some, besides poets, to be “ the matter whereof women's tongues were made, which seldom cease wagging.”

3. *P. nigra*, leaves deltoid, pointed, serrated, smooth on both sides; catkins all lax and cylindrical; stigmas 4, simple, spreading. *Black Poplar*.

Hab. In plantations. March. 12

282. RHODIOLA.

1. *R. rosea*, root thick, fleshy; stem simple, a spawn high; leaves numerous, glaucous, fleshy, obovate, bluntly toothed; flowers yellow with orange-coloured nectaries, in a terminal cyme. *Rose-root*.

Hab. Coast of Berwickshire. I first observed this plant growing on Fastcastle in the spring of 1827, and in the autumn of the same year on rocks between Lamberton and Burnmouth, with the Rev. A. Baird, who, in the following summer, found it in great profusion and luxuriance at the foot of a deep glen about a mile south of Fastcastle. The locality is interesting and unexpected, as the plant, in general, affects alpine rocks. May, June. 24

When recently dried, the root has an agreeable scent, resembling rose-water. The plant has the habit of a *Sedum*, and is not uncommon in gardens.

V. ENNEANDRIA.

283. MERCURIALIS.

1. *M. perennis*, root creeping; stem simple, 1 foot high; leaves rough, ovate, serrated; flowers in axillary short lax spikes. *Perennial Mercury*.

Hab. Shady places frequent. Banks of the Whiteadder above Edrington, Dr Thompson. Banks of the Eye, Rev. A. Baird. About Warren, &c. April, May. 7/

This plant, in drying, becomes of a blue green colour, and to water it yields a fine deep blue, but no means have been discovered by which it can be fixed. The herb is poisonous.

VI. MONADELPHIA.

284. JUNIPERUS.

1. *J. communis*, leaves 3 in each whorl, tipped with a spine, spreading, longer than the ripe fruit; stem erect. *Common Juniper*.

Hab. Heaths common; also on our sea-banks. May. 12

The wood is of a reddish colour, very hard and durable, used in veneering, and in making cups, cabinets, &c. The berries are used in medicine; and they form an important article of commerce in Holland, where they are employed in the distillation of geneva; and they give that singular flavour which our distillers try to imitate by oil of turpentine.—HOOKER.

285. TAXUS.

1. *T. baccata*, leaves two-ranked, crowded, linear, flat; receptacle of the barren flowers globular. *Common Yew*.

Hab. Woods. March, April.

The Yew is not a common tree in Berwickshire, and now only to be found in plantations; but as it is certainly in-

digenous to Britain, and was in common use among the Borderers before exotics were introduced, it seems not unreasonable to conclude that the present trees are no aliens, but lineal descendants of the native stock. It was generally planted in churchyards,—not, however, on account of the “melancholy” of its shade, nor from its “funereal hue,”—but “for the convenience and ready use of the several parishioners,” to whom it afforded the favourite material for the long bow, a weapon in the use of which our ancestors were famous. At a very early period the Yew was considered pre-eminently of a “venomous quality, and against man’s nature,” and even to exhale effluvia fatal to those who chanced to repose under its shade; but this, though repeated by numerous authors, is altogether untrue. The fresh leaves, however, are poisonous. Dr PERCIVAL mentions an instance of three children being killed by a spoonful of them administered as a remedy against worms; and they prove speedily fatal to cattle accidentally tasting them when young and tender. The berries are harmless.

* “ Now more I love thee, melancholy Yew,
 Whose still green leaves in solemn silence wave
 Above the peasant’s red unhonoured grave,
 Which oft thou moisteneth with the morning dew
 To thee the sad, to thee the weary fly;
 They rest in peace beneath thy sacred gloom
 Thou sole companion of the lowly tomb!
 No leaves but thine in pity o’er them sigh.
 Lo! now, to fancy’s gaze, thou seem’st to spread
 Thy shadowy boughs to shroud me with the dead

LEYDEN

CLASS XXIII.

POLYGAMIA.

—“ Juvat integros accedere fontes
Atque haurire, juvatque novos decerpere flores.”
LUCRETIVS.

I. MONŒCIA.

285. *ATRIPLEX*. UNITED FLOWER—*calyx* inferior, in 5 deep segments; *corolla* none; *stamens* 5; *style* deeply cloven; *seed* 1, depressed. FERTILE FLOWER—*calyx* inferior, in 2 deep segments; *corolla* none; *style* deeply cloven; *seed* 1, compressed.

I. MONŒCIA.

286. *ATRIPLEX*.

1. *A. patula*, stem herbaceous, spreading; leaves triangular-lanceolate, somewhat halbert-shaped; *calyx* of the fruit tuberculated at the sides; seeds finely dotted. *Spreading Orache*.

Hab. Waste and cultivated grounds, and on the sandy sea-shore, very common. July, Aug. ☉

2. *A. angustifolia*, stem herbaceous, spreading; leaves lanceolate, entire, the lower ones partly 3-lobed; calyx of the fruit halbert-shaped, slightly warty at the sides; seeds scarcely dotted. *Narrow-leaved Orache.*

Hab. Waste grounds frequent. July, Aug. ☉

3. *A. littoralis*, stem herbaceous, erect; leaves all linear, entire, variously toothed or sinuated; calyx of the fruit sinuated, its disk armed with prominent tubercles. *Sea Orache.*

Hab. Muddy salt marshes. "Coast beyond Beal, plentiful," Thomp. Aug. Sept. ☉

ADDITIONAL SPECIES.

8. VERONICA.

V. filiformis, stem spreading, hairy; leaves all alternate, heart-shaped, deeply serrate; flowerstalks very long, always straight; limb of the corolla longer than the calyx; seeds cupped. *Tab. rost.*

V. filiformis, Lam. and Decand. Fl. Fr. v. 388. (excluding Sm. in Lin. Tr. i. 195.) On the authority of Arnott, Meyer, and Schleicher.

V. agrestis β , Sm. Fl. Græc. t. 8. Prod. i. 9.

V. Buxbaumii, Tenore, Fl. Neap. i. 7. t. 10. (Settled by specimens from Tenore), Linn. Syst. Veg. by Sprengel, i. 75.

Hab. Cultivated grounds. In the shrubbery in front of the house at Whiterig, Berwickshire. August—Oct. ☉

Stems spreading, one or two feet long, branched at the base or simple, round, more or less coloured, and clothed with soft white hairs. Leaves alternate, rarely opposite at the base, ovate-heart-shaped, deeply serrate, rough with short bristles, which also fringe the margins. Flowerstalks axillary, straight, filiform, hairy, 1 or 1½ inch long, sometimes slightly curved at the insertion of the capsule. The stem flowers from the very base. Segments of the calyx ovate-lanceolate, hairy, 3-nerved, the lateral nerves small. Flowers large, light blue, beautifully streaked with darker lines; segments broadly ovate, entire; tube white, hairy within. Anthers large, blue, on white curved thick filaments. Capsule inversely heart-shaped, bristly. Seeds white, rough, concave beneath, four or five in each cell.

SMITH considered this a variety of *V. agrestis*, to which it is certainly nearly allied. But *V. agrestis* is a smaller and smoother plant, with the lower leaves always opposite, on longer stalks, and less decidedly heart-shaped. The flowerstalks also are generally curved, never longer than the leaves; and the segments of the small corolla do not exceed, but are rather shorter than the segments

of the calyx; while in *V. filiformis* the flowers equal those of *V. Chamædrys* in size, and are little inferior in beauty. It is necessary to substitute the following character of *V. agrestis* for that at page 7:—"Stem spreading, hairy; leaves ovate, deeply serrate, the lower ones opposite; flowerstalks about equal to the leaves in length, curved when in fruit; corolla shorter than the calyx; seeds cupped."

For the above synonyma I am indebted to Mr WINCH. It may be considered a very valuable addition to the history of the species, since it is founded on specimens received from TENORE, MEYER, SCHLEICHER, and ARNOTT, who gave him the Montpellier plant, which must be DECANDOLLE'S. Mr WINCH has also British specimens from BORRER and E. FORSTER. The former botanist found it several years ago near Henley in Sussex, and communicated specimens to Sir J. E. SMITH and others; but it is singular that no notice is taken of it in the English Flora, nor, so far as we know, in any work on the botany of this island.





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in Italics.*

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<i>Doronicum pardalianches</i>	185	<i>Eupatorium</i>	170
<i>Draba</i>	139	<i>cannabinum</i>	180
<i>verna</i>	141	<i>Euphorbia</i>	194
<i>Drosera</i>	50	<i>exigua</i>	197
<i>rotundifolia</i>	74	<i>helioscopia</i>	197
<i>Duckweed</i>	9	<i>Peplus</i>	196
<i>Dyer's Greenweed</i>	158	<i>Euphrasia</i>	128
<i>Earth-nut</i>	68	<i>officinalis</i>	135
<i>Echium</i>	44	<i>Eye-bright</i>	135
<i>vulgare</i>	54	<i>Fagus</i>	193
<i>Elder</i>	72	<i>sylvatica</i>	207
<i>Eleocharis</i>	11	<i>Fedia</i>	10
<i>palustris</i>	16	<i>olitoria</i>	13
<i>Elm</i>	66	<i>Fescue-grass</i>	25-7
<i>Empetrum</i>	210	<i>Festuca</i>	12
<i>nigrum</i>	218	<i>bromoides</i>	26
<i>Enchanter's night-shade</i>	6	<i>duriuscula</i>	26
<i>Epilobium</i>	85	<i>elatior</i>	27
<i>alsinifolium</i>	87	<i>lohiacea</i>	26
<i>angustifolium</i>	86	<i>ovina</i>	25
<i>hirsutum</i>	86	<i>pratensis</i>	27
<i>montanum</i>	87	<i>rubra</i>	26
<i>palustre</i>	87	<i>sylvatica</i>	27
<i>parviflorum</i>	86	<i>vivipara</i>	25
<i>tetragonum</i>	87	<i>Feverfew</i>	188
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<i>common</i>	185	<i>luteum</i>	119
<i>Flix-weed</i>	145	<i>Glaux</i>	46
<i>Fool's-parsley</i>	69	<i>maritima</i>	64
<i>Forget-me-not</i>	51	<i>Gylchoma</i>	126
<i>Foxglove</i>	138	<i>hederacea</i>	131
<i>Fox-tail grass</i>	19	<i>Globe-flower</i>	124
<i>Fragaria</i>	108	<i>Glyceria</i>	12
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<i>Fraxinus</i>	4	<i>maritima</i>	23
<i>excelsior</i>	5	<i>procumbens</i>	23
<i>Fumaria</i>	154	<i>rigida</i>	23
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<i>sylvaticum</i>	175	<i>conglomeratus</i>	78
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<i>avenaceus</i>	22	<i>lampocarpus</i>	80
<i>lanatus</i>	21	<i>liniger</i>	81
<i>mollis</i>	21	<i>squarrosus</i>	79
<i>Holly</i>	39	<i>uliginosus</i>	80
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<i>spicatum</i>	205	<i>dubium</i>	120
<i>Myrrhis</i>	48	<i>Rhœas</i>	120
<i>temulenta</i>	68	<i>Parietaria</i>	34
		<i>officinalis</i>	39
<i>Nardus</i>	11	<i>Parnassia</i>	50
<i>stricta</i>	18	<i>palustris</i>	73
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A
FLORA
OF
BERWICK-UPON-TWEED.

BY
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VOL. II.
CRYPTOGAMOUS PLANTS.

J. CARFRAE & SON, EDINBURGH; AND
LONGMAN, REES, ORME, BROWN, & GREEN,
LONDON.

MDCCCXXXI.

ARMY

ASSISTANT QUARTERMASTER GENERAL

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CLASS XXIV.

CRYPTOGAMIA.

“ Then spring the living herbs, profusely wild,
O'er all the deep-green earth, beyond the power
Of botanists to number up their tribes :
Whether he steals along the lonely dale,
In silent search ; or through the forest, rank
With what the dull incurious weeds account,
Bursts his blind way ; or climbs the mountain-rock,
Fir'd by the nodding verdure of its brow :
With such a liberal hand has Nature flung
Their seeds abroad, blown them about in winds,
Innumeros mix'd them with the nursing mould,
The moistening current, and prolific rain.”

THOMSON.

CRYPTOGAMIA.

CRYPTOGAMOUS plants bear no flowers visible to the naked eye; and they likewise differ from the Phænogamous in their habit or general form, which is peculiar, but exceedingly varied and dissimilar in the different tribes. In their parts of fructification, some naturalists have endeavoured to trace out, by the aid of the microscope, organs analogous to the stamens and styles of true flowers; but the analogies seem more fanciful than real, and are at present generally discredited. It may, at all events, be safely asserted, that nothing is certainly known relative to the manner in which the seeds of the Cryptogamia are fertilized. Some indeed have gone so far as to call them asexual plants, denying that they possess either flowers or true seeds, but are propagated merely by buds, or, as it is now the fashion to speak, by means of *sporules*; and this opinion gains support from all the recent observations which have been made on the structure and germination of these corpuscles. They are destitute of an essential part of a true seed—the embryo; and their growth is not a mere development of parts already existing, as is the case in the seeds of Phænogamous plants, but parts entirely new are produced. Farther, it depends entirely on the situation in which these grains have been deposited, what is to be the root and what the future frond. The root and plumule of true seeds pullulate always from fixed points determined by their structure, whatever be the position in which they are placed; but in the grains of the Cryptogamia the root sprouts from that part which happens to be next the earth, while the opposite point is developed into a frond. These are important differences, but still there seems to

be no impropriety in denominating the latter seeds, for the word literally means the organized particles produced by plants in a peculiar receptacle from which new plants of the same species are generated, and has no reference to structure. And I the more willingly use the term in the following pages, because the analogy between buds and Cryptogamous seeds is somewhat doubtful. The former are produced in no peculiar or appropriate organs, nor are they the parts designed more particularly by nature to continue the species; but the latter are certainly thus designed, they are lodged and matured in appropriate vessels, formed often on a complex and always on a determinate plan.

The class has been said to be a "truly natural" one; but the word natural must here be used in a peculiar sense, for the materials of which it is composed are of the most heterogeneous character. The Mushroom surely has no relation with the Fern, nor the Sea-weeds with the Moss, yet they are all Cryptogamous. Even of the orders into which the class has been divided, it is, perhaps, too much to say that they are natural. The Dorsiferous Ferns and the Mosses are natural orders in the judgment of the vulgar as well as of the botanist; but if the latter will maintain that the Fungi and Algæ are natural groups, it is, I should think, at the expense of common sense, which revolts from the decision. These orders have no one character common to all their constituents; and plants which differ both in their structure, appearance, and mode of propagation, may be bound together by the fancy of botanists, and for their convenience, but they are not the less unnatural on that account. We are apt to deceive ourselves in this. Practice has made us familiar with a certain classification, and at last we find so little difficulty in referring any plant to its order and place, that we persuade ourselves we do so from some real resemblances between the plants, and consequently that there must be something natural in our systems. But were our first attempts remembered,—how often they were abortive and erroneous, or grounded on guess rather than on induction, I am confident it would be admitted that our present facility is solely the result of tutorage and practice, by which our associations have been made to run in an artificial channel. The practised botanist at once refers the moulds and the parasitical blights of corn to the Mushroom tribe; but do any others perceive any resemblance between mushrooms and mould, or is there really any

thing in their structure to warrant such a collocation? So far is this from being the case, that, were the latter to grow habitually under water, they would probably be considered as the members of another order, viz. that of the Algæ; yet all Algæ are not aquatic, nor, were it so, has the habitat ever professedly been allowed to influence our decision relative to affinities. Nor will the uninitiated believe that arrangement a natural one, which unites under one head the sea-tangle with its woody stem and fibrous frond, and the green scum which floats on the surface of stagnant fresh water, rootless, stemless, leafless, and scarcely organized.

I offer these remarks, not because I disapprove of our present systems—that would be presumptuous in one who has none better to propose,—but because they are invented and adopted by authors who avowedly disdain the aid of artificial methods, and sneer contemptuously at their followers as the bigoted idolaters of LINNÆUS, and less than wise! The local florist is too humble a character to be the object of these sneers; and regardless of a censure which there is no danger of encountering, I would gladly avail myself of any method in arranging this work, had it the sole recommendation of conducting the student easily to the names of the objects sought after, and that in preference to any natural system, if the latter were the more difficult of the two. No one will ever study with success or zeal the relations of objects until he knows something of their structure and qualities; and that method which communicates most easily the competent degree of knowledge for the purpose, is, in my opinion, the most proper for the beginner.

The Cryptogamous plants described in this volume may be arranged in the following orders.

A. NON-AQUATIC.

* *Structure vascular.*

(*A transverse section of the stem exhibits longitudinal tubes or vessels collected into bundles: in habit, the plants somewhat resemble Phænogamous flowers: after being dried they will not revive by immersion in water.*)

- I. EUISETACEÆ. Stem jointed, tubular; joints sheathed; branches whorled, leafless.

II. **FILICES.** Stem continuous, solid, with a furrow on one side ; leaves large, plane, nerved, bifarious or simple.

III. **LYCOPODINEÆ.** Stem continuous, solid, leafy ; leaves imbricated, small, simple, rigid ; fruit in the axils of the upper leaves, or (apparently) in catkins.

* * *Structure cellular.*

(*The cells communicate freely with one another, so that, when a dried specimen is immersed in water, it is freely imbibed, and the plant resumes the appearance of life.*)

+ *Plants with leaves or leaf-like : colour always green.*

IV. **MUSCI.** Stem clothed with small simple leaves ; fruit in a stalked capsule covered with a lid and deciduous calyptra.

V. **HEPATICÆ.** Plants leafy or frondose ; fruit in nearly globular distinct capsules, destitute of lid and calyptra.

+ + *Plants leafless nor leaf-like : colour rarely green.*

VI. **LICHENES.** Perennial plants, with a distinct frond resembling a crust, or a rosaceous lobed expansion, or a coriaceous membrane, or a branched coral ; the fructification saucer-like receptacles, or tubercles, or black lines, either scattered over the surface or placed on the tips of the branches.

VII. **FUNGI.** Polymorphous plants, generally of short duration, and always without a crust, fleshy, corky, filamentous, or pulverulent ; the seeds dispersed over the external surface, or contained within peculiar membranes or organs.

B. AQUATIC.

VIII. **ALGÆ.** Leafless, flowerless plants, with no distinct axis of vegetation, consisting either of simple vesicles lying in mucus, or of articulated filaments, or of lobed fronds, formed of uniform cellular tissue. Fruit very various in structure and position.

ORDER I.

EQUISETACEÆ.

“ Laborum dulce lenimen.”

HOR.

1. *EQUISETUM*. Catkins terminal; seeds separately embraced by 4 spiral filaments, presumed to bear pollen.

1. *EQUISETUM*.

1. *E. sylvaticum*, stem rough, furrowed, the furrows about 12; sheaths light brown, with about 12 darker teeth; branches about 12 in a whorl, compound, curved downwards, smooth, square, the branchlets triangular.

Hab. Moist woods and deans, frequent. Longridge Dean.

Woods about Houndwood, &c. April, May. ♀

From 12 to 18 inches high, with several whorls of compound branches, which are arched in the most graceful manner, and readily distinguish the species. The fertile plants are at first naked, but they begin to acquire branches before the catkin has withered.

2. *E. fluviatile*, stem smooth, even; sheaths with numerous setaceous teeth; branches numerous, simple, or with very few branchlets, rough, quadrangular, the angles furrowed; fertile stems unbranched, with numerous crowded deeply-toothed sheaths.

Hab. Watery places, frequent. April. ♀

The fertile stems, about a span in height, appear very early in spring, when they are conspicuous from their large yel-

lowish cone-shaped catkins. These are succeeded by the sterile plants, which rise to the height of 2 or 3 feet; and the crowded patches which they form, bear much resemblance to a plantation of firs in miniature.

The structure of the Equiseta is very beautiful. Fig. *a*. Tab. V. is a view of a section of the stem of the species before us, and Fig. *b* of the same plate is a similar view of the *E. arvense*. Around the hollow centre there is a circle of small canals, and external to that another circle of much larger ones placed in an alternating order. The number and relative size of these canals vary in each species; but the number in both circles of any specimen is always the same, and they correspond pretty exactly to the number of branches in a whorl. They are separated from one another by a cellular tissue or web, each circle, however, being in distinct layers, for although there is apparently no line of distinction, they can be separated with ease. The canals run through the stem in a straight line, neither giving off branches, nor communicating by anastomosis; nor is the continuity of the tubes interrupted by the septa which divide the centre of the stem into regular compartments. That this is the case may be proved by an easy experiment. If after the root and top is cut away, we insert one end in water, and suck through it, as boys do when they drink through a straw, the fluid will rapidly ascend to the mouth. In this experiment, the fluid ascends probably by the canals of the outer circle; but a careful dissection will shew the canals of the inner circle to be equally uninterrupted. The outer canals communicate also with the branches, for, with a fine syringe, I have succeeded in forcing water through one of them into the adjoining branch. The experiment does not always succeed, because the water finds an easier escape from the opposite end of the stem. The epidermis of some species (*E. sylvaticum*) is marked with the oblong apertures of pores arranged in parallel lines, but in *E. fluviatile* these are not visible. The external canals contain only air; the inner probably convey the fluid necessary to the growth and nourishment of the plant. The whole structure is very analogous to that of monocotyledonous plants, of the grasses or canes in particular; and it seems very obvious that the Equiseta must grow in the same manner. De Candolle, however, is almost the only author who has associated them with this family; and in common with others, he places them next to Ferns, which, in a natural system, is perhaps a questionable arrangement. In the true Ferns the stem is solid, and there is no appearance of open canals disposed in circles. On the con-

trary, their longitudinal vessels of small calibre are collected into fascicles placed in the midst of a cellular tissue uniform throughout. In the *Pteris aquilina* the tubes form several winding and unequal fasciæ, distinguished by their lighter colour and irregular distribution, Pl. V. Fig. *c*; in the common *Aspidia* they are collected into circular bundles, the two towards the groove of the stalk being much larger than the others, which are placed near the outer edge (Fig. *d*); and each bundle is separated from the cellular tissue by a dark brown corneous sheath, loosely connected both with the tubes and the cellular parenchyma*. Ferns, then, in their structure resemble the stalks of the herbaceous Dicotyledones; and the grooved stem, and the manner in which the vessels ramify through the leaf, support the analogy, brought still closer by the observations of Dr YULE on the germination and evolution of their seeds. —*Edin. Encyclop.* ix. 327.

3. *E. arvense*, stem smooth, furrowed; furrows about 10; sheaths about 10, cleft; branches 8–10 in a whorl, rough, long, simple or branched, square: fertile stem unbranched, with distant deeply-toothed sheaths.

Hab. Moist cultivated fields, too common. May. 7/

“It is a troublesome plant in pastures, and disagreeable to cows, never touched by them unless compelled by hunger, and then bringing upon them an incurable diarrhœa. It does not seem to affect horses or sheep;” LIGHTFOOT—yet said to be especially unwholesome to swine.

4. *E. palustre*, stem deeply furrowed; furrows about 8; sheaths with about 8 lanceolate teeth; branches 4–8 in a whorl, simple, erect, roughish, pentangular.

Hab. Spongy watery places, frequent. June, July. 7/

Every seed of an *Equisetum* is encompassed with 4 spiral filaments attached to its base, which curl and twist about, from their hygrometric property, in a very curious manner, and move the seed along with them in various directions. If a spike, when ripe in spring, be shaken over a piece of white paper, the seeds will fall out in form of a fine brown powder; and if they be damped a little by

* The figures referred to—the first attempts of the artist in engraving—give but a faint idea of the beauty of the structure described, or of the drawings from which they were copied.

gently breathing on them, and be then examined with a magnifier, they will be seen crawling about on the paper, like so many little spiders.—DRUMMOND'S *First Steps*, p. 341.

5. *E. limosum*, stem smooth, green, striate, fistular; branches in imperfect whorls, often wanting, short, smooth, square; sheaths remote, with about 16 black teeth; catkin small. *Paddock-pipe*.

Hab. Ponds and mill-dams, common. June, July. 2/

The striated appearance of the stem is produced by the pel-
lucidity of the part opposite to the longitudinal canals.

6. *E. hyemale*, stem glaucous green, naked, rough, striated, mostly branching at the base; sheaths distant, black at the top and bottom, with very small deciduous teeth; catkin terminal, small.

Hab. Rough boggy places, rare. On Lamberton Moor, plentiful. July, Aug. 2/

SIR H. DAVY first ascertained that the cuticle of this species contains a large quantity of silex, or flinty earth, so disposed as to make a natural file, which renders it useful in polishing wood, ivory and brass. For this purpose the stems are imported from Holland under the name of *Dutch rushes*.—All the *Equiseta* contain this silex in greater or less quantity, and thus offer another remarkable analogy between them and the cereal grasses and bamboo. WALLIS tells us that the dairy-women in the neighbourhood of Nunwick and Chipchase, where the plant is plentiful, use it for smoothing their milk-vessels, a purpose for which it is well fitted; but it is too rare in Northumberland to be generally so applied, as the words of LIGHTFOOT seem to imply.

“The various species of the *Equisetum* have been recommended by Professor LENHOSSEK of Vienna as a very powerful and specific diuretic, which neither oppresses the digestive organs, nor induces any bad consequences in the vascular or nervous systems, and is therefore preferable to squill, digitalis, colchicum, and other diuretic remedies, whose unpleasant consequences are too well known.” Some particulars relative to the mode of administering this remedy, which, so far as I know, has not been tried in this country, may be found in the *Edin. Med. and Surg. Journal*, vol. xxvii. p. 218.

ORDER II.

FILICES.

" But on St John's mysterious night,
 Sacred to many a wizard spell,
 The time when first to human sight
 Confest the mystic fern-seed fell;
 Beside the sloe's black knotted thorn,
 What hour the Baptist stern was born—
 That hour when heaven's breath is still,—
 I'll seek the shaggy fern-clad hill,
 Where time has delved a dreary dell,
 Befitting best a hermit's cell;
 And watch, 'mid murmurs muttering stern,
 The seed departing from the Fern,
 Ere wakeful demons can convey
 The wonder-working charm away,
 And tempt the blows from arm unseen,
 Should thoughts unholy intervene."

LEYDEN.

* *Capsules aggregate, on the back of a leafy frond.*

2. POLYPODIUM. *Capsules in roundish scattered masses. Cover none.*
3. ASPIDIUM. *Capsules in roundish scattered masses. Cover nearly orbicular, fixed by the centre, separating all round.*
4. CYSTEA. *Capsules in roundish scattered masses. Cover orbicular, concave, fixed by a lateral point underneath, finally reflexed and jagged.*

5. *ASPLENIUM*. *Capsules* in linear scattered *masses*. *Cover* linear, separating at the side towards a midrib or vein.
6. *SCOLOPENDRIUM*. *Capsules* in nearly linear twin scattered *masses*, between 2 parallel veins. *Covers* 2, linear, opposite, folding over each other.
7. *BLECHNUM*. *Capsules* in linear solitary *masses*, close to the midrib. *Cover* linear, flat, separating towards the rib.
8. *PTERIS*. *Capsules* in linear nearly marginal *masses*. *Cover* from the inflexed margin of the frond, wavy, continuous, separating at its inner edge.

* * *Capsules on a branched terminal stalk.*

9. *BOTRYCHIUM*. *Common stalk* compound, flattened. *Capsules* sessile, naked, globular, simple.

2. POLYPODIUM.

1. *P. vulgare*, root creeping, scaly ; frond lanceolate, deeply pinnatifid, the lobes semi-alternate, linear-oblong, obtuse, crenulate ; masses rather large, biserial. *Common Polypody*.

Hab. In crevices of rocks, at the base of old trees in woods, and on old walls, very common. 2/

This Fern has, in common with most of our native herbs, been blotted from the list of medicinal plants, where it long retained a place as a mild purgative, or as an ingredient of vulnerary salves.

“ Here finds he on an oak rheum-purging Polypode.”

DRAYTON.

2. *P. Phegopteris*, frond triangular, hairy, pinnate, on a slender smooth stalk ; leaves lanceolate, united at the base, semi-alternate, the lower pair deflexed, pinnatifid, the segments obtuse, entire ; masses of capsules small, towards the margin of each segment.

Hab. On rocks at the foot of Cheviot above Langley-ford, Winch. July. 2/

3. *P. Dryopteris*, stalk slender, 3-branched at top; branches spreading, somewhat pendent, pinnate; leaves linear-lanceolate, pinnatifid, the segments obtuse; masses of capsules in rows near the margins.

Hab. On wooded rocky banks. Rocks at the foot of Cheviot above Langley-ford, Winch. On a wooded bank of Ale-water above Ale-mill; and on the banks of the Dye above Longformacus, Rev. A. Baird. Wooded banks of the Whiteadder between the Retreat and Elm-cottage. July. 2/

3. ASPIDIUM.

1. *A. Oreopteris*, frond pinnate; leaves lanceolate, the lower pairs opposite, the rest alternate, deeply pinnatifid, besprinkled underneath with resinous globules; masses of capsules small, regularly and beautifully arranged along the inflexed margins of the lobes.

Hab. At the foot of Cheviot above Langley-ford, Winch. Banks of the Whiteadder between the Retreat and Elm-cottage; and of the Dye at Longformacus, abundant. July. 2/

2. *A. Filix-mas*, stalk scaly, bipinnate; leaves lanceolate, alternate, with oblong obtuse serrated leaflets; masses biserial near the midrib, the cover orbicular. *Male Fern.*

Var. 1. Frond a span high, simply pinnate, with undivided oblong crenated leaves.

Var. 2. Pinnate, the leaves deeply pinnatifid, with short lobes, serrated only at the apex.

Var. 3. Bipinnate, the leaflets elongate, serrated throughout.

Hab. Woods, deans, and hedge sides. Varieties 2 and 3 are common, but of var. 1., which is very remarkable, I have seen only Irish specimens, gathered by the Rev. J. Baird. June—Aug. 2/

In the last century, the root of this Fern was retailed as a secret nostrum by Madame NOUFLEUR, a French empi-

ric, for the cure of tape-worm. The secret was purchased for a considerable sum of money by LOUIS XV.; and the physicians then discovered that the same remedy had been administered for the same purpose by Galen. Its reputation has been very variable, but it is now seldom prescribed, and it is certain we possess more efficacious and equally safe remedies.

3. *A. aculeatum*, stalk chaffy, bipinnate; leaves linear-lanceolate, chaffy, leaflets shortly stalked, equal on both sides of the rachis, ovate, serrated, the serratures tipped with a bristle; masses biserial, with a circular cover.

Var. 1. Leaflets longer, rather acute, scarcely lobed at the base, slightly inclined. *A. aculeatum*, SMITH. (Pl. iii. f. 1.)

Var. 2. Leaflets short, obtuse, erect, distinctly lobed. *A. angulare*, SMITH. (Pl. iii. f. 2.)

Hab. In the fine wooded dean above and below the Pease Bridge; both varieties plentiful. July. 2/

Fronde from 1 to nearly 3 feet in height, lanceolate, disposed in circular tufts, generally of a very dark green colour, bipinnate. Stalk very chaffy, as well as the ribs of the leaves and leaflets. Leaves linear-lanceolate, elegantly and regularly alternate, the lower pairs narrow and deflexed. Leaflets close, equal on both halves, stalked, ovate, bluntish, more or less distinctly lobed at the base, which is parallel with the rachis, serrated, the serratures tipped with a bristle. Clusters of capsules biserial, sometimes crowded and confluent; sometimes distinct and distant; with a circular deeply umbilicate cover. This appears to be the *Asp. lobatum* of Dr HOOKER in *Flor. Scot.* ii. 154, and *Brit. Flora*, i. 443. Although admitted into the *Flora Scotica*, and also into the *Flora Edinensis* of Dr GREVILLE, there is reason to believe that, previous to its discovery in the above station, there was no certainty of its being a native of Scotland; nor as yet has any other Scottish habitat been discovered.

4. *A. lobatum*, stalk chaffy, bipinnate; leaves linear-lanceolate, chaffy; leaflets decurrent, ovate-acute, oblique, equal on both sides, the lower pair erect and disproportionably large, serrated, the serratures bristly: masses biserial, distinct or confluent, with a circular cover. (Pl. iii. f. 3.)



C. J. fecit.

Hab. On rocks in wooded deans, not uncommon. Banks of the Eye, Rev. A. Baird. Banks of the Whiteadder opposite Edrington Castle; Dulaw Dean, &c. July. ¼

A more common and less beautiful Fern than the last, of which some good botanists have considered it a variety. After a careful examination of numerous specimens gathered by myself, with some which I owe to the liberality of Mr Arnott, I cannot but consider them distinct, and the annexed outline figures of the leaves give a correct idea of their differences, and may enable the student to determine the plants with comparative facility. No dependence is to be placed on the relative differences in the colour, rigidity or breadth of the fronds, for these characters vary equally in both species. The chief, and indeed only distinction, lies in the leaflets,—stalked, erect, and more or less lobed, in the one,—decurrent, oblique, and not lobed, in the other. The latter is certainly the *Asp. aculeatum* of HOOKER, in *Flor. Scot.* ii. 154; and likewise of the foreign botanists, if the specimen given in MOUGEOT and NESTLER's *Stirpes Cryptogamæ*, No. 206, be a genuine representative of their plant. This name in fact is much preferable, seeing that what SMITH calls *lobatum* is not lobed, while his *aculeatum* is. The figure of the former in *Eng. Bot.* is a fair representation of our plant, which is the *Polypodium aculeatum* of BOLTON, excellently delineated in tab. 26 of his useful work, and erroneously referred to by SMITH as *Aspidium aculeatum*.

Such are our Berwickshire plants, which are surely identical with the English Ferns bearing the same names. Dr HOOKER, however, says that his Scotch specimens appear to him (and where is there a more competent judge?) “decidedly distinct” from his English ones; and yet curiously enough, he describes the latter in a *Flora Scotica*, and passes over in silence the true and distinct natives of the country, equally neglected in his subsequent *British Flora*. “Nisi omnem geographicam cognitionem plantarum perire volumus, pernecessarium est ut talia errata corrigamus,” says the excellent WAHLENBERG; and Dr HOOKER, we doubt not, will admit the justice of the remark. Dr GREVILLE, in his *Flora Edinensis*, has likewise followed a plan, in relation to these species, which leads to not less confusion. He has apparently copied the *specific* characters from HOOKER, and has appended to them the *detailed* descriptions of SMITH, descriptions which, as we have seen, do not in fact belong to the plants characterized! I make these remarks not in the spirit of captious criticism, but because I think

they may be useful to the young botanist, for by him the *Flora Scotica* and *Flora Edinensis* will ever be resorted to for information relative to the plants of Scotland, and the works are therefore deserving of commentary.

5. *A. dilatatum*, stalk chaffy, bipinnate; leaves lanceolate, the leaflets deeply pinnatifid, with nearly opposite serrated segments, the serratures pointed with a short bristle; masses biserial near the midrib; cover kidney-shaped, tumid, finally orbicular, with a lateral notch.

Var. 1. Frond triangular; leaves rather distant, nearly opposite with the lower range of leaflets more elongated than the upper.

Var. 2. Frond contracted below; leaves rather close; regularly alternate, with the upper and lower range of leaflets nearly equal.

Hab. Moist woods, deans, and under shelving rocks, common. July, Aug. 2/

A very variable species in regard to size and form, but in general the outline of the frond is triangular, and the height between one and two feet. The *var. 1*, is most common.

6. *A. Filix-femina*, stalk smooth or chaffy, bipinnate; leaves alternate, linear-lanceolate, the leaflets narrow, linear-oblong, pinnatifid, the segments with 2-4 pointless serratures; masses biserial; cover oblong, finally somewhat kidney-shaped, jagged.
Lady-Fern.

Hab. Shaded woods and deans, common. July, Aug. 2/

“ Where the copsewood is the greenest,
Where the fountain glistens sheenest.
Where the morning dew lies longest,
There the Lady-fern grows strongest.”

The stalk is commonly described as smooth, but it is as often chaffy all the way up, sometimes greatly so, and always more or less so near the root. The cover of the masses of seeds is oblong, and separated from one side only, whence the plant is by many considered as a species of *Asplenium*.

The seeds of Ferns are exceedingly numerous and minute, contained in capsules collected into clusters, which, in general, are beautifully arranged on the lower surface of the leaf. Each capsule is encircled by an elastic crenulated

ring, which at maturity suddenly bursts, tearing up the membrane and scattering the seeds. These, in former times, it was imagined, could be seen only on St John's night, at the hour when the Baptist was born; and whoever became possessed of them was thereby rendered invisible. "We have the receipt of fern-seed, we walk invisible." The gathering of such a convenient receipt was, as might be presumed, not a little hazardous, and the chastisement to which the adventurer exposed himself, is described in the lines selected for a motto.

All our species of *Aspidia* are common, but so far as the animal part of creation is concerned, they are of little or no value. Man applies them to no economical purpose; no cattle will brouse on them; birds find them sterile of food; nor do even insects seem to feed upon them. Yet their great numbers and very general diffusion, are proofs that they grow not in vain:—perhaps to the earth and to the atmosphere they principally minister, affording to the one, by their decay, an annual addition of soil rich in alkaline salts; and effecting changes on the other conservative of its purity. But in these purposes there is nothing special, and I love best to look upon Ferns as ornamental herbs, designed, perhaps chiefly, to vary the mantle with which the Author of all has covered the surface of our globe:—

"For not to *use* alone did Providence
Abound, but large example gave to man
Of grace, and ornament, and splendour rich,
Sulted abundantly to every taste,
In bird, beast, fish, winged and creeping thing,
In herb, and flower."—

They are, it is true, sombre in colour, and put forth no gaudy flowers to captivate the vulgar; but in elegance and harmony of form, and in picturesque effect, they excel most native plants. Unless checked by injury or mechanical restraints, all the *Aspidia* grow in circular tufts, the plume-like fronds bending outwards with a graceful curve. Even the most unobservant must have noticed this, and the curious circinate manner in which the young shoot up, for there is scarce a situation in which they do not prove ornamental: but mostly so when they grow from the clefts of rocky and woody precipices, or by the margins of the little rivulets which take their murmuring course through the deep deans of our retired heathy districts, or—best of all, when pendent over the sides of their linns or little cascades.

4. CYSTEA.

1. *C. fragilis*, frond a span high, oblong, lanceolate, bipinnate; leaves lanceolate, pinnatifid, the segments ovate, cut or serrated; midribs bordered; masses crowded; cover irregularly torn.

Hab. On wet shady rocks and old walls, rare. "In the Pigeon's Cove, near the Needle-eye," Thomp. Near Mains, Berwickshire, Rev. A. Baird. July. 2/

5. ASPLENIUM.

1. *A. Trichomanes*, frond linear, pinnate, with a dark brown polished stalk, keeled underneath; leaves small, roundish, ovate, obtuse, crenate.

Hab. In the crevices of shaded rocks, frequent, growing in tufts generally about a span high. Banks of the Eye near Netherbyres; and in the ravine above Burnmouth, Rev. A. Baird. Rocks above Killoe, N. D. On rocks by the water below the Pease Bridge, &c. May—Dec. 2/

2. *A. marinum*, frond lanceolate, pinnate, with a smooth stalk dark brown towards the root; leaves ovate-oblong, serrated, unequal, and wedge-shaped at the base.

Hab. In crevices of rocks by the sea-side, not common. Rocky cliffs from the sandy-beds northwards, most abundant in the Pigeon's Cove, Thomp. Near Eyemouth, Rev. A. Baird. June—Oct. 2/

3. *A. Adiantum nigrum*, frond somewhat triangular, bipinnate; with a smooth stalk, dark towards the base; leaves stalked, triangular, with obtuse cut and serrated leaflets or segments.

Hab. In crevices of rocks and about the roots of trees in deans, frequent. June—Oct. 2/

4. *A. Ruta muraria*, frond alternately twice compound, the leaves rhomboid wedge-shaped, notched at the extremity.

Hab. Fissures of rocks in tufts about 3 inches high. Spindleston Crag, N. Mr R. Embleton. Has not been

found in Berwickshire. (On Melrose Abbey, abundant.)
June—Oct. 7/

6. SCOLOPENDRIUM.

1. *S. vulgare*, frond simple, broadly lanceolate, smooth, heart-shaped at the base; stalk shaggy. *Common Hart's tongue.*

Hab. On shaded rocks. In Dunglas-Den, Dr Parsons. "Pigeon's Cove near the Needle-eye," Thomp. On an old garden-wall at Netherbyres, Rev. A. Baird. Near Chillingham, James Mitchell, Esq. R. N. On a cave between Fast-Castle and Redheugh by the sea shore; and on rocks by the water-side below the Pease Bridge. July. 7/

"In the moat at Kenilworth Castle," says Dr HOOKER, "I have gathered this handsome fern more than 2 feet long;" a size not superior to that of specimens which I have seen from the neighbourhood of Fast-Castle. These large specimens were the hangings of a cave never illumined by the sun's rays; and indeed the freedom and vigour with which this, and some other Ferns, grow in these gloomy places, is a remarkable fact in their history.

7. BLECHNUM.

1. *B. boreale*, smooth; fronds lanceolate, pinnate, pectinate; the leaves of the sterile ones linear-lanceolate, entire, opposite towards the base, becoming semi-alternate; those of the fertile frond all very narrow, pointed and alternate.

Hab. In deans and on heaths, in spreading dark green circular tufts, common. July. 7/

This very elegant fern has received the name of *Rough Spleenwort* for its reputed virtues in diseases of the spleen, concerning which GERARDE speaks in a tone of scepticism most unusual with him. "There be Empiricks or blinde practitioners of this age, who teach, that with this herbe not onely the hardnesse and swelling of the Spleene, but all infirmities of the liuer also may be effectually, and in very short time remooued, insomuch that the sodden liuer of a beast is restored to his former constitution againe, that is, made like unto a raw liuer, if it bee boyled againe with this herbe. But this is to be reckoned among the old wiues fables, and that also which DIOSCORIDES telleth of, touching the gathering of Spleenewort in the night, and other

most vaine things, which are found here and there scattered in old books, from which most of the later writers do not abstaine, who many times fill up their pages with lies and frivolous stories, and by so doing do not a little deceive young students."

8. PTERIS.

1. *P. aquilina*, stalk repeatedly 3-branched ; branches bipinnate ; leaflets linear-lanceolate, alternate and opposite, the lowermost pinnatifid, with opposite regular segments, the upper undivided.
Common Brakes.

Hab. Heaths, deans, and hedge bottoms, very common.
July. 22

This is in general a vulgar unornamental species, growing, not in tufts, but in extensive patches on heathy pastures. It is hence a troublesome weed, and in many places is annually cut down with the scythe. In wooded deans, however, it frequently attains a great size, assumes a graceful port, and a darker green, so as to contribute its full share to the picturesque beauty of the scene. When the main stalk is cut across, the pith has "the figure of a cross, or, as some have fancied, the imperial or spreading eagle, which induced Linnæus to apply to it the trivial name of *aquilina*." Dried fern is occasionally used as litter for cattle ; and in some parts of Scotland the people thatch their houses with the stalks, fastening them down with ropes made either of birch, bark, or heath. Mr NEILL informs me it has been lately applied to pack apples for winter keeping. Apples preserved in straw, in saw-dust, &c. uniformly contract a taint or flavour from the straw, the paper, or the wood ; but a layer of bracken and a layer of apples may be four or five times alternated, without the least risk of taint, for three months. The boxes so packed, and covered with a lid, were placed on a dry bank close by a wall, and covered up with straw and earth. The apples kept plump and quite untainted. In many of the western isles the people gain, or did gain, a very considerable profit from the sale of the ashes of Fern to soap and glass-makers. The vermifuge properties of the powdered root are not now valued ; nor do the country people now look upon a bed of the green plant as a sovereign cure for the rickets in children, though I do believe it will be found a more efficacious remedy than the hard procrustean beds of some modern surgeons.

2. *P. crispa*, frond twice or thrice pinnate; barren leaflets wedge-shaped, cut; fertile ones elliptic-oblong, obtuse, convex.

Hab. Among loose stones on our higher hills, rare, in tufts of a bright pea-green hue. "On rocks at the foot of Cheviot above Langley-ford," Winch. On Cheviot near the summit, sparingly. On the south bank of the Whiteadder, about half a mile above Abbey St Bathans, sparingly, Mr Thomas Brown. (On the most eastern of the Eildon hills, Roxburghshire, abundant.) July. 2/

SOUTHEY describes this as "the stone-fern or mountain-parsley, the most beautiful of all our wild plants, resembling the richest point lace in its fine filaments and exquisite indentations."

9. BOTRYCHIUM.

1. *B. lunaria*, leaf solitary, pinnate; leaflets fan-shaped, notched: herb smooth, scarcely a span high. *Common Moonwort.*

Hab. Hilly pastures, rare. On Bemerside hill in the west of Berwickshire, Mr W. Baird. Coldingham Moor above Lumsden. Near Langley-ford. June. 2/

This curious plant could not fail to attract the attention of the astrologists. The leaflets are like unto a half-moon, and a herb impressed with the semblance of the planet to which this lower sphere is a vassal, cannot but contain its virtues in essence, and verily

" ——— have power
O'er sprites in planetary hour."

Hence "it hath beene vsed among the Alchymistes *, and witches to doe wonders withall, who say, that it will loose lockes, and make them to fall from the feet of horses that graze where it doth grow, and hath beene called *Martagon*, whereas they are all but drowsie dreames and illusions."— Yet even the incredulous GERARDE, Master in Chirvrgerie, affirms that moonwort is singular to heale greene and fresh wounds; and Dr NEEDHAM maintains that it is to be nnumbered "inter certissima dysenteriae remedia," when applied by way of ointment to the region of the kidneys,—a direction in which the Doctor's faith in the doctrine of signatures appears, and hence these panegyrics.

* CHAUCER mentions it as part of the Alchymists' furniture,—

"And herbes coude I tell eke many on,
"As egremonie, valerian, and Lunarie."

ORDER III.

LYCOPODINEÆ.

“ Oh ! there is sweetness in the mountain air,
And life, that bloated ease can never hope to share !”

BYRON.

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10. **LYCOPodium.** *Capsules* axillary, solitary, sessile, roundish, slightly compressed, of 2 equal valves, and 1 cell, bursting vertically. *Seeds* numerous, chaffy, very minute.

10. LYCOPodium.

1. *L. clavatum*, stem creeping, irregularly branched ; branches ascending, incurved at the points ; leaves scattered, incurved, subulate, serrated, with long diaphanous points ; spikes 2 or 3, cylindrical, stalked, with dilated membranous scales. *Fox's Tail*.

Hab. Plentiful on all our moors. July—Aug. ¼

The stem attains such a length that the “herd callants” in our upland moors, are wont to twine it round their hats, counting it no small ornament.

“ Or with that plant which in our dale
We call stag-horn, or *Fox's-Tail*,
Their rusty hats they trim :
And thus, as happy as the day,
Those Shepherds wear the time away.”

WORDSWORTH.

A similar custom prevails among the young Laplanders. "Vidi aliquando," says LINNÆUS, "grato spectaculo, pueros Lapponum ex hoc muscoserta confecisse capitique suo eadem imposuisse, horrentibus undique spicis distichis, hirsutie Faunis et Satyris similes." The seeds are used in Germany for producing artificial lightning on the stage, for when dispersed in the air they may be ignited in the same manner as powdered rosin; an experiment which we have sometimes made with perfect success.

A section of the stem (Tab. v. Fig. a) shows it to have the following structure. First, the outer green or epidermoid circle, within which is a rather broad white one, analogous in position to the wood, and minutely cellular. This is succeeded by another green circle also cellular, and which surrounds the pith, divided by some imperfect septa into angular compartments loosely cellular, or rather perforated with longitudinal canals opened by the cut. The root exhibits the same appearances, but the circles are not coloured, and the epidermis being membranous, separates easily from the wood beneath, which is here more compact and solid. The roots are strong tough fibres pullulating from the under surface at irregular intervals; and when just pulled, I have found them surrounded with a copious transparent glairy fluid.

According to M. VASTRING, the *Lycopodia* are likely to become of importance in dyeing. He asserts that woollen cloth boiled with them, especially with *L. clavatum*, acquire the property of becoming blue when passed through a bath of Brazil wood.—LINDLEY.

2. *L. Selaginoides*, stems recumbent, branched, shorter than the solitary ascending tumid spikes; leaves scattered, lanceolate, fringed, the floral ones larger and more spreading. (2 or 3 inches high, slender.)

Hab. Boggy places on moors. "Fields west of the Steps of Grace farm-house," Thomp. Lamberton Moor, and on the Lammermuirs, frequent. Aug. 21

3. *L. Selago*, stems upright, forked, level-topped; leaves in 8 rows, uniform, lanceolate, pointless, entire, slightly spreading. (4 inches high, robust and rigid.)

Hab. Mountainous heaths. Moors west of Belford: Cheviot, Thomp. Lamberton moor. Dirrington-Law. June—Aug. 21

In the Island of Raasay, near Sky, and some other places, the inhabitants make use of this plant instead of alum, to fix the colours in dyeing. The Highlanders and Swedes sometimes take an infusion of it as an emetic and cathartic, but it operates violently, and, unless in a small dose, brings on giddiness and convulsions. LIGHTFOOT. "Solent rustici, boves vel sues phthiriasi laborantes decocto hujus musci lavare, quo facto intra aliquot dies a molestis hisce insectis liberantur."—LIN.

The *Selago* is mentioned by PLINY as a plant which the Druids gathered with much ceremony, and with various superstitious observances, to employ it in the cure of diseases of the eyes, or as a charm to avert misfortune. Some commentators are of opinion that this is the plant.

4. *L. alpinum*, stems prostrate; branches erect, clustered, forked, level-topped; leaves acute, keeled, imbricated in 4 rows; scales of the spikes ovate-lanceolate, flat.

Hab. On heaths. Frequent in Cheviot, Wallis. Lamberton Moor, and not uncommon in the Lammermuirs. Aug.
24

The leaves are of a glaucous-green colour; and those of the flowering stalks are closely imbricated all round.

Note.—In this and the preceding Orders I have as usual adhered to the nomenclature of Sir J. E. SMITH's English Flora; and it is not without a feeling of great regret that I now part with this admirable guide, for the work was left incomplete by its author, whom SPRENGEL has with much propriety designated as the "dignissimus Linnaei hæres." Though a follower of the Linnean system, which no one understood so well, or more candidly appreciated, and which I trust may still find some other place in science "than among the records of things whose fame has passed away,"—he never depreciated a rival system, but on the contrary estimated it at its proper value, and gladly applauded in it whatever was worthy of applause;—unlike in this respect some who vainly affect to consider themselves his superiors. There is no individual to whom the British botanist ought to be more grateful—none whose memory he ought to cherish more dearly—than that of Sir J. E. SMITH.

ORDER IV.

MUSCI.

“ Cum omnia circa nos torpescunt et languescunt, cum flumina rigent, nemora silent, campi latent nivibus obtecti, ubique luctus, rerum facies decolor et tristis mortis imago; MUSCI inter vegetationis ruinas emergentis et sericeo colore fulgentes, rupes et lapides obducunt.”

LINNÆUS.

* *Mouth of the capsule furnished with a fringe.*

† *Fringe double : Fruit-stalks lateral.*

11. HYPNUM. *Outer fringe of 16 teeth ; inner one of a membrane cut into 16 equal segments, with filiform processes frequently placed between them. Calyptra dimidiate.*
12. ANOMODON. *Fringe consisting of 16 teeth, and a ciliary process arising from each tooth. Calyptra dimidiate.*
13. HOOKERIA. *Outer fringe of 16 teeth ; inner one of a membrane divided into 16 entire segments. Calyptra mitral.*
14. FONTINALIS. *Outer fringe of 16 teeth ; the inner of 16 ciliary processes connected by transverse bars, and forming a reticulated cone. Calyptra mitral. Capsule oblong, enclosed in a scaly perichætium.*

†† *Fringe double : Fruit-stalks terminal*

15. **BARTRAMIA.** *Capsule* subglobose. *Outer fringe* of 16 teeth ; the *inner* of a membrane divided into 16 bifid segments. *Calyptra* dimidiate.
16. **BRYUM.** *Capsule* ovate-oblong, drooping, *Outer fringe* of 16 teeth ; the *inner* of a membrane cut into 16 equal segments, with filiform processes frequently placed between them. *Calyptra* dimidiate.
17. **FUNARIA.** *Capsule* pear-shaped. *Outer fringe* of 16 teeth ; the *inner* also of 16 opposite to those of the outer. *Calyptra* mitral, pointed.
18. **ORTHOTRICHUM.** *Capsule* cylindraceous, erect. *Outer fringe* of 16 teeth approaching in pairs ; *inner* one of 8 or 16 ciliary processes, sometimes wanting. *Calyptra* mitral, grooved, more or less pilose.
19. **POLYTRICHUM.** *Outer fringe* of 32 or 64 equidistant incurved teeth ; *inner* one of a dense horizontal membrane connected with the outer teeth. *Calyptra* dimidiate, commonly double, the external one pilose.

††† *Fringe single : Calyptra dimidiate.*

20. **TORTULA.** *Fruitstalks* terminal. *Fringe* of 32 filiform twisted teeth, more or less united at the base by a tube-like membrane.
21. **DIDYMODON.** *Fruitstalks* terminal. *Fringe* of 16 or 32 teeth approaching in pairs, or united at the base.
22. **DICRANUM.** *Fruitstalks* terminal, or rarely lateral. *Fringe* of 16 bifid equidistant teeth.
23. **WEISSIA.** *Fruitstalks* terminal. *Fringe* of 16 entire equidistant teeth.

†††† *Fringe single : Calyptra mitral.*

24. **CINCLIDOTUS.** *Fruitstalks* terminal, on short lateral branches

Fringe of 32 filiform twisted teeth anastomosing at their base.

25. TRICHOSTOMUM. *Fruitstalks* terminal, sometimes on lateral branches. *Fringe* of 16 equal teeth divided to the base, or 32 placed together in pairs.
26. GRIMMIA. *Fruitstalks* terminal. *Fringe* of 16 entire or perforated, rarely cleft, equidistant teeth. *Calyptra* covering little more than the lid.
27. ENCALYPTA. *Fruitstalks* terminal. *Fringe* of 16 teeth. *Calyptra* campanulate, smooth, entirely covering the mature capsule.
28. SPLACHNUM. *Fruitstalks* terminal. *Fringe* of 8 double teeth. *Capsule* with an evident *apophysis*. *Calyptra* smooth.
29. TETRAPHIS. *Fruitstalks* terminal. *Fringe* of 4 equidistant erect teeth.

■ ■ *Mouth of the Capsule naked.*

30. ANICTANGIUM. *Capsule* on a terminal stalk; *lid* deciduous. *Calyptra* mitral.
31. GYMNSTOMUM. *Capsule* on a terminal stalk; *lid* deciduous. *Calyptra* dimidiate.
32. SPHAGNUM. *Capsule* entire, raised on a *receptacle* resembling a fruitstalk; *lid* deciduous. *Calyptra* irregularly torn.
33. PHASCUM. *Capsule* entire, on a terminal stalk; *lid* persistent. *Calyptra* dimidiate.
34. ANDRÆA. *Capsule* 4-valved, the valves cohering at the extremity by means of the persistent *lid*. *Calyptra* irregularly torn.

11. HYPNUM.

OBS. In Plate IV. there is given a figure in outline of the leaves of the Hypna here described; and as the same terms will, as far as possible, be used throughout to designate the same forms, the figures may be useful in ascertaining the species of the other genera of mosses. The number of the figures in the plate corresponds to the number of the species in the text.

▪ *Leaves imbricated all round, erect, and straight.*

† *Leaves entire.*

1. *H. serpens*, stems creeping, matted, with short slender branches; leaves small, patent, ovate-acuminate, the nerve evanescent; fruitstalks not 1 inch; capsule curved, cylindraceous; lid conical, short.

Hab. On trunks of trees, and decaying wood, common. Spring.

2. *H. plumosum*, stems creeping, matted, irregularly branched; branches numerous, short, erect; leaves ovate-acute, thickish, the nerve reaching half way; fruitstalks smooth, $\frac{1}{2}$ inch; capsule urceolate, subcernuous; lid conical.

Hab. On rocks at the sides of rivers and rivulets, liable to be overflowed, common. Spring.

The specific name is unsuitable, for the moss has nothing plummy about it, and is one of the least beautiful of the genus. The leaf is liable to considerable variation in its figure; and I have seen it with the margin distinctly serrated.

3. *H. populeum*, stem creeping, matted: branches numerous, erect; leaves lanceolate-acuminate, nerved throughout, obscurely serrulate at the points, the margins slightly reflexed; fruitstalks scarcely 1 inch, smooth; capsule ovate, cernuous; lid conical.

Hab. On trees and stone walls, not rare. Spring.

The description which SMITH gives of his *H. implexum* agrees in every respect with our plant, which corresponds also with the specimens in MOUGEOT and NESTLER's *Stirpes Cryptogamicæ*, No. 519.

4. *H. lutescens*, stems matted, much branched; leaves lanceolate, acuminate, striated, the nerve disappearing below the point; fruitstalks about 1 inch, roughish; capsule ovate, cernuous; lid conical, acute.

Hab. On trees and walls near the ground, not uncommon. Spring.

5. *H. sericeum*, stems creeping, matted; branches numerous, short; leaves lanceolate, acuminate, striate, the nerve disappearing below the point; fruitstalks not 1 inch; capsules erect, elliptical; lid conical.

Hab. On walls and trees. Spring.

Remarkable for the silky glossiness of the leaves, which are marked with two plaits or striæ on each side of the nerve.

6. *H. polyanthos*, stems creeping, matted: branches numerous, short, erect; leaves erect, lanceolate, much acuminate, with two short and very faint nerves at the base; fruitstalks $\frac{1}{2}$ inch; capsule erect, elliptical, with a conical point. *Leskea polyantha*, GREVILLE, *Crypt. Fl.* t. 151.

Hab. Trunks of trees, rare. In the Dean above Twizel Bridge, Rev. A. Baird. Oct.

More slender than the following, from which it is very distinct.

H. polyanthos, stems matted, much branched: leaves ovate-lanceolate, acuminate, nerveless, concave; fruitstalks 1 inch; capsule nearly erect, somewhat curved, cylindraceous; lid conical, acute. SMITH, *Fl. Brit.* 1278.

Hab. Trunks of trees, very common. Spring.

It is now admitted that this is merely a variety of *H. cupressiforme* described below; but as its characters bring it evidently under this section, we have thought to facilitate the student's inquiries by enumerating them here.

7. *H. albicans*, stems ascending, irregularly branched; branches erect; leaves glossy, ovate-lanceolate, acuminate, striate, the nerve disappearing above the middle; fruitstalks about 1 inch; capsule ovate, cernuous; lid conical.

Hab. In sand on Spittal and Scrammerston Links. In the bog in Haiden Dean; and on Lamberton Moor. Nov.

8. *H. nitens*, stems erect, irregularly pinnate; branches rather short, patent, simple; leaves lanceolate-acuminate, strongly striated, the nerve faint; "fruitstalks 2 inches; capsule oblong, cernuous; lid conical."

Hab. Bogs. Haiden Dean; not in fruit.

9. *H. Schreberi*, stems pinnate, somewhat compressed; leaves elliptical, apiculate, concave, nerveless; fruitstalks 1 inch; capsule ovate, cernuous; lid conical.

Hab. Plentiful on moors at the sides of whin and juniper bushes. Spring.

There are two very minute nerves at the base of each leaf, which, however, it requires a good magnifier to discover.

10. *H. purum*, stems pinnate, robust; branches simple, tapered, spreading; leaves broadly elliptical, apiculate, concave, the nerve scarcely reaching half-way up; fruitstalks $1\frac{1}{2}$ inch; capsule ovate, cernuous; lid conical.

Hab. Banks, &c. very common. Spring.

According to DILLENIUS this is used by the anglers in Lancashire to scour their worms, whence the specific name. Our anglers employ it for the same purpose, but indiscriminately with other mosses.

11. *H. cuspidatum*, stem erect, pinnate; branches spreading, cuspidate; leaves ovate-lanceolate, concave, nerveless; fruitstalks 2 inches; capsule oblong, curved, cernuous; lid conical.

Hab. Bogs, common. Winter.

† † *Leaves serrated.*

12. *H. splendens*, stems bipinnate, somewhat compressed, gene-

rally proliferous; leaves appressed, ovate, concave, with an acuminate serrated point, and two short nerves at the base; fruitstalks often aggregate, $1\frac{1}{2}$ inch; capsule ovate, cernuous; lid subulate, recurved.

Hab. In deans and on moors, producing fruit freely in winter and early spring.

The leaves on the branches are small, ovate-acute, and quite entire.

13. *H. proliferum*, stem tripinnate, very elegant, proliferous; leaves small, appressed, heart-shaped, acute, the nerve running nearly to the point, the back papillose; fruitstalks more than an inch; capsule large, curved and arched; lid with a subulate point.

Hab. Banks in heathy and shaded places, common, but rather rare in fruit. Spring.

14. *H. praelongum*, stems slender, trailing, matted, sub-bipinnate; leaves patent, those of the stem heart-shaped, of the branches lanceolate-acute, the nerve not reaching the point; fruitstalks 1 inch; capsule ovate, cernuous; lid with a long subulate curved point.

Hab. Moist shaded banks, and on trunks of trees, especially such as are in a state of decay, common. Winter.

15. *H. striatum*, stems irregularly branched, robust; leaves patent, heart-shaped, acuminate, striate, the nerve disappearing beyond the middle; fruitstalks smooth; capsule oblong, curved, cernuous; lid with a long subulate point.

Hab. Woods and mossy banks, common. Spring.

16. *H. rutabulum*, stems variously branched, matted; leaves patent, ovate-lanceolate, acuminate, sub-serrulate, the nerve reaching half-way; fruitstalks rough; capsule ovate, cernuous; lid conical, short.

Hab. On walls and banks, very common. Winter.

17. *H. velutinum*, stems variously branched, matted; leaves erect, lanceolate-acuminate, subserrulate; nerve reaching half way; fruitstalks roughish; capsule ovate, cernuous; lid conical.

Hab. At the foot of walls and trees. Winter.

18. *H. confertum*, matted; branches numerous, short; leaves erecto-patent, lanceolate, acute, nerved more than half way up; fruitstalks smooth; capsule ovate, cernuous; lid rostrate.

Hab. On the trunks of old trees in deans. Winter.

19. *H. ruscifolium*, matted, variously branched; leaves patent, heart-shaped, acute, concave, the nerve reaching nearly to the point; fruitstalks smooth; capsule ovate, cernuous; lid with a subulate curved point.

Hab. In rivers and rivulets abundant, covering stones and the front of little cascades with a dark green matting. Winter.

20. *H. curvatum*, stems irregularly branched; branches numerous, curved; leaves ovate-lanceolate, concave, serrated only at the points, the nerve disappearing beyond the middle; fruitstalks about 1 inch; capsule ovate, erect; lid subulate.

Hab. Woods and mossy banks, frequent. Winter.

The curvature of the branches is a character of this and the following species, in general little obvious, and sometimes not to be observed.

21. *H. myosuroides*, stems irregularly branched; branches fascicled, curved; leaves lanceolate, acute, the nerve disappearing near the middle; capsule ovate, erect; lid conical, mucronulate.

Hab. Trunks of trees and rocks in woods. Winter.

A small and neat species, growing in compact tufts. The stems are erect; the branches crowded, numerous, and slender. The fruitstalks arise from the upper side, and are rather more than $\frac{1}{2}$ inch in height. The capsule is generally inclined, but not cernuous.

22. *H. alopecurum*, stem bare below, dendroidal; leaves rather patent, ovate, acute, serrated towards the point, 1-nerved; "fruitstalks not an inch; capsule ovate, cernuous; lid rostrate."

Hab. Woods and shaded banks, not in fruit.

23. *H. dendroides*, stem bare below, dendroidal; leaves lanceolate, concave, serrated at the point, 1-nerved, and striate; fruitstalks $1\frac{1}{2}$ inch; capsule erect, elliptical; lid conical, acuminate.

Hab. Mossy banks on a turfy soil, common, but very rare in fruit.

• • Leaves imbricated all round, their points recurved.

24. *H. stellatum*, stem erect, branched; leaves loosely set, lanceolate, much acuminate, entire, nerveless, straight; fruitstalks 2 inches; capsule oblong-ovate, curved, cernuous; lid conical.

Hab. In bogs on moors. Spring.

25. *H. loreum*, stem pinnate; branches spreading, attenuated at the ends; leaves lanceolate, acuminate, concave, serrated, faintly 2-nerved at the base; fruitstalks 1 inch; capsule ovate, cernuous; lid conical.

Hab. In deans and on heaths, not uncommon. Summer.

26. *H. triquetrum*, stem robust, irregularly pinnate; leaves heart-shaped, acuminate, serrated, faintly striated, 2-nerved at the base; fruitstalks upwards of 1 inch; capsule ovate, short, cernuous; lid conical.

Hab. In woods and deans, and on heaths, common. Winter.

This large species is one of the most useful for packing, being, whether in a dry or wet state, peculiarly light and elastic. The stalk, when deprived of its leaves, is red.

27. *H. squarrosum*, stem slender, irregularly pinnate; branches patent; leaves ovate, curved, very much acuminate, serrated, faintly 2-nerved at the base; fruitstalks 1 inch; capsule ovate, cernuous; lid conical.

Hab. Mossy banks in woods and on heaths, common. Winter.

• • • Leaves with their points all directed to one side.

† Leaves nerveless, or with only 2 short nerves at the base.

28. *H. scorpioides*, stem irregularly pinnate; branches erect, thick, soft and watery; leaves imbricate, broadly ovate, ventricose, entire; "fruitstalks 2 inches; capsule oblong-ovate, curved, cernuous; lid conical."

Hab. Bogs. Lamberton and Coldingham moors, but not in fruit.

29. *H. cupressiforme*, stems irregularly pinnate, compressed, the branches with incurved tips; leaves closely imbricated, lanceo-

late, acuminate, entire, concave, curved; fruitstalks 1 inch; capsule cylindraceous, sub-erect; lid conical, with a point.

Hab. On banks, and at the roots of trees, common. Spring.

30. *H. molluscum*, stems pectinate; leaves sickle-shaped, lanceolate, acuminate, serrated, faintly 2-nerved at the base; fruitstalks 1 inch; capsule ovate, cernuous; lid conical.

Hab. Mossy banks and on rocks in woods, common. Winter.

An elegant species, with repeatedly-divided stems, lying over each other in loose elastic tufts. Branches beautifully pectinated, their extremities curled like ostrich plumes in miniature. SMITH says that it perfects its fruit in May and June, and is rare in that state; but in this neighbourhood it bears fruit abundantly every year at the commencement of winter.

†† *Leaves with a mesial nerve.*

31. *H. filicinum*, stem pinnate; branches simple; leaves broadly ovate, acuminate, almost straight, nerved to the point, serrulate; "fruitstalks 2 inches; capsules oblong-ovate, curved, cernuous; lid conical."

Hab. Bogs, not common. Haiden Dean.

Mr ARNOTT is of opinion that there are no certain limits between this and the following species. The length of the nerve and shape of the leaf vary on the same specimens; and, even under a high magnifying power, they are often quite entire or very slightly toothed. (*In Litt.*) Our own specimens support this opinion, being just intermediate between the best marked examples of both species.

32. *H. commutatum*, stems pinnate, plume-like; leaves small, sickle-shaped, ovate-acuminate, the nerve evanescent; fruitstalks $1\frac{1}{2}$ inch; capsule oblong-ovate, curved, cernuous; lid conical.

Hab. Wet places, particularly on dripping rocks in a calcareous soil, frequent. It is rare in fruit, but Mr BAIRD has gathered it in that state in different parts of Berwickshire.

In the *Muscologia Britannica*, the leaves are described and delineated as rather strongly serrated. They appear to me to be entire or nearly so, as SMITH says they are. It

is a beautiful species, and grows in large matted tufts, of a very dark green on the surface, but always stained underneath with an ochrey yellow. The *petrified moss*, so abundant in this neighbourhood, is a tuft of *H. commutatum*, encrusted and solidified by a deposition of the lime from the water in which it grows. It delights to hang over the precipitous front of dripping rocks, or of small cascades, whose waters strain themselves through the dense and plummy foliage as through a sponge. LEYDEN must have had it in view when he wrote of the "listless shepherd"—

"His is the lulling music of the rills,
Where, drop by drop, the scanty current spills
Its waters o'er the shelves that wind across,
Or filters through the yellow, hairy moss."

33. *H. aduncum*, stems erect, irregularly pinnate; leaves lanceolate, much acuminate, sickle-shaped, entire, the nerve disappearing beyond the middle; fruitstalks 2 inches; capsule oblong-ovate, curved; lid conical.

Hab. Bogs and wet places, common. Winter.

34. *H. fluitans*, stems slender, elongate, somewhat pinnate; branches very short; leaves rather distant, long and flexuose when dry, lanceolate-subulate, sickle-shaped, nerved, entire; "capsule ovate-oblong, curved, cernuous; lid conical."

Hab. In moss pools on the Lammermuirs, not common, nor in fruit.

35. *H. palustre*, stems creeping, matted; branches numerous erect, with curved tips; leaves ovate-acute, entire, slightly curved, the nerve variable in length, and sometimes wanting; capsule oblong-ovate, sub-erect; lid conical.

Hab. On wet, stony, and gravelly places on moors, and by the sides of rivulets, common. Winter.

36. *H. uncinatum*, stems creeping, matted, pinnate; leaves sickle-shaped, lanceolate-subulate, very obscurely serrated, striate, the nerve disappearing below the point; fruitstalks an inch; capsule cylindraceous, arched, cernuous; lid conical.

Hab. On moist walls, not common. At the road-side above Greenlaw, plentiful. Winter.

* * * * Leaves two-ranked ; stem flattened.

37. *H. denticulatum*, stems matted ; leaves ovate, pointed, entire, 2 short nerves at the base ; capsule cylindrical, inclined ; lid short, conical.

Hab. On stones, and at the roots of trees in moist woods.

38. *H. complanatum*, stems pinnate ; leaves oblong, obtuse, apiculate, entire, nerveless ; “ capsule ovate, erect ; lid rostrate.”

Hab. Trunks of trees, common, but not in fruit.

39. *H. undulatum*, whitish ; stem procumbent ; loosely branched ; leaves ovate-acute, entire, transversely undulate, 2 faint nerves at the base ; capsule oblong, furrowed, arched, cernuous ; lid rostrate ; fruitstalks 2 inches.

Hab. In woods and on moors, but very rarely in fruit. In plantations about Blackadder, Rev. A. Baird. On Cheviot and the adjoining hills ; and on the Lammermuirs, plentiful.

The *Hypna* are so very abundant, and so generally dispersed, that it would, perhaps, be no exaggeration to say that they form a fourth part of the vegetable clothing of this island. They are met with every where : in many old pastures they usurp the place of the more useful grasses ; they form a large proportion of the vegetation of moors ; they flourish at hedge bottoms, in woods and deans, on rocks, and even on sand links ; and they grow in profusion in every marsh, and bog, and stream. The share they thus contribute to the green covering of the earth is considerable, especially in winter, when they are in their greatest beauty and perfection. In this season of cold and vicissitude, they foster the roots of other plants ; and they preserve amid their dense tufts myriads of insects which might otherwise perish. In summer, birds make much use of them in building their nests, for which they are very suitable by their lightness, warmth, and elasticity. If we except their occasional use in packing brittle wares, they are of no direct utility to man,—unless, with the excellent LIGHTFOOT, we admit amongst the *utilities* that entertainment and agreeable instruction which they afford to the contemplative mind of the naturalist, at a season when few other plants offer themselves to his view.

12. ANOMODON.

1. *A. viticulosum*, stem creeping; branches erect, cylindrical, long, and generally simple; leaves patent, ovate-lanceolate, entire, nerved, crisped when dry; "fruitstalks 1 inch; capsule cylindrical, erect."—*Hypnum viticulosum*, LIGHTF. *Fl. Scot.* 754. *Neckera viticulosa*, SMITH, *Fl. Brit.* 1275.

Hab. At the roots of trees in dry woods. Banks of the Eye, between Ayton-house and Netherbyres, Rev. A. Baird.

13. HOOKERIA.

1. *H. lucens*, stems procumbent, slightly branched, plane; leaves bifarious, large, ovate, obtuse, entire, nerveless, reticulated; fruitstalks 1 inch; capsule ovate, cernuous; lid with a subulate point.—*Hypnum lucens*, SM. *Fl. Brit.* 1295.

Hab. On moist rocks in deans, and under shaded banks, not common. Longridge-dean, Rev. A. Baird. On shelving rocks at Hudshead. Winter.

This fine genus was, with great propriety, named, by Sir J. E. SMITH, in honour of Dr HOOKER, Professor of Botany in the University of Glasgow, who has done more to facilitate the study of the order to which it belongs than any other naturalist.

14. FONTINALIS.

1. *F. antipyretica*, stems floating, branched, triangular; leaves lanceolate, entire, nerveless, folded, and acutely keeled; capsules on short bud-like branches, imbricated with oval scales, elliptical; lid conical, acute.

Hab. In ponds and still running waters abundant, but not common in fruit. Summer.

"The specific name was given to this plant in allusion to its being employed by the Swedes to fill up the spaces between the chimney and the walls, and thus, by excluding the air, prevent the action of the fire."

15. BARTRAMIA.

1. *B. pomiformis*, stems caespitose; leaves long, subulate, ser-

rate, crisped when dry; fruitstalks erect, 1 inch; capsule sub-erect, furrowed.

Hab. In fissures of rocks by rivers, and in deans, forming tufts of a bright pleasant green, surmounted, in April and May, by its elegant globular fruit, not uncommon. The variety with the stems much lengthened out, I have gathered at the base of Cheviot.

2. *B. fontana*, stems cæspitose, branched; branches straight, erect, fastigiate; leaves short, closely imbricated, ovate, acuminate, serrulate; fruitstalks $2\frac{1}{2}$ inches, erect; capsule oblique, furrowed.

Hab. Wet spongy places in our moors, common. June.

“Besides the branches which produce capsules, there are others terminated with a radiated calyx, consisting of 5 or 6 leaves, surrounding a dusty orange-coloured disk, which HALLER affirms to be the origin of the future branches, into which the stalk will be divided.”—LIGHT-FOOT.

3. *B. arcuata*, stems elongate, irregularly branched; branches spreading; leaves patent, lanceolate, acuminate, striate, serrated; “fruitstalks very short, curved, at length lateral; capsule smooth, globose.”

Hab. In bogs on elevated moors. Coldingham Moor, Rev. A. Baird. Lamberton Moor; but not in fruit in either place.

This, and many other mosses which grow in bogs, have their stems densely clothed with a brown woolly substance, the nature of which seems still imperfectly understood. Some consider it a distinct plant; others believe it to be merely the radicle fibres of the moss. Its entangled mode of growth; its situation, for it creeps up the whole stem, and is not confined to the base; the uniformity of its appearance in the different species; and the fact that mosses in general have no roots of the kind, militate against the latter opinion, which rests merely on the observation that there is an organic connection between the fibres in question and the moss, a circumstance which perhaps is to be expected in a parasitical plant. The filaments, whatever be their nature, are wiry, and very much branched, the branches diverging and spreading, without any appearance of joints.

16. BRYUM.

• *Margins of the leaf entire, or only obscurely serrate at the point.*

1. *B. carneum*, stems short, simple, or branched with innovations; leaves rather distant, ovate-lanceolate, reticulated, obscurely serrulate at the point; fruitstalks $\frac{1}{2}$ inch; capsule turbinate, pendulous.

Hab. Ditch banks, not common. Spring.

2. *B. argenteum*, stems short, branched at the base; leaves closely imbricate, broadly ovate, acuminate, concave, nerve disappearing below the point; fruitstalks less than an inch; capsule oblong, pendulous.

Hab. On walls, thatched roofs, and gravel walks, very common, and conspicuous from its remarkable silvery appearance. Spring.

3. *B. caespitium*, stems short, branched; leaves ovate, acuminate, the nerve excurrent; fruitstalks 1 inch; capsule obovate, pendulous.

Hab. On walls in cushion-like tufts, common. Spring.

The small variety which SMITH describes as *B. bicolor*, *Fl. Brit.* 1355, occurs occasionally in moist clay spots on our sea-banks, where it is conspicuous in spring by its large dark red capsules.

4. *B. capillare*, stems branched; leaves obovate, twisted when dry, the nerve produced into a hair-like point; fruitstalks upwards of 1 inch; capsule oblong, pendulous.

Hab. On trunks of old trees in woods, in large dense even patches; also on turfy banks in moors.

5. *B. turbinatum*, stems short, branched with innovations; leaves ovate-acuminate, the nerve excurrent; fruitstalks $1\frac{1}{2}$ inch; capsule elongate, pyriform, pendulous.

Hab. In sandy moist places on moors. Spring. A variety of this species, I presume, with the leaves of a rose-red colour, is of frequent occurrence on stones and rocks by the sides of rivulets, but it does not bear capsules. Distinguished from *B. caespitium* more by its

less compact habit and greater size, than by its specific characters.

6. *B. ventricosum*, stems elongated, branched with innovations; leaves lanceolate, erect, obscurely serrulate near the points, nerved throughout; fruitstalks 2 or $2\frac{1}{2}$ inches; capsule oblong-ovate, pendulous.—*B. ventricosum et bimum*, SMITH.

Hab. Marshy ground. In the boggy field below the old Lamberton Toll, &c. Autumn.

7. *B. palustre*, stems elongate, branched; branches erect, cuspidate; leaves lanceolate, 1-nerved, the superior inclined to one side and curved; fruitstalks 2 inches; capsule furrowed, sub-cernuous, ovate, bulging; lid conical.—*Minum palustre*, SM. *Fl. Brit.* 1346.

Hab. Bogs, in dense yellowish-green conspicuous masses. Summer.

“The branches of many of the older plants are terminated with a wide stellated crown of leaves, in the centre of which is a cluster of minute reddish dust-like scales. Some of these stellated crowns are found proliferous, producing often two or three short new pale stalks, about $\frac{1}{4}$ th of an inch high, naked towards the top, and terminated each with a minute scaly head.”—LIGHTFOOT.

8. *B. punctatum*, stems elongated, nearly simple; leaves large, alternate, obovate, very obtuse, reticulated, margin thickened, the nerve disappearing below the point; fruitstalks 1 inch; capsule ovate, pendulous; lid conical, subulate.

Hab. In bogs, amongst alders and other brush wood, frequent. Spring.

* * *Leaves distinctly serrated.*

9. *B. rostratum*, stem simple; leaves alternate, broadly ovate, reticulated, the margin thickened and toothed, the nerve excurrent; fruitstalks more than 1 inch, 1 to 5 from the same stem; capsule ovate, pendulous; lid long, subulate.

Hab. In bogs with the preceding. Spring.

10. *B. cuspidatum*, stems elongated, simple, or nearly so; leaves large, alternate, broadly ovate-lanceolate, reticulated, the nerve

excurrent, margin thickened and toothed above, crisped when dry ; “ capsule ovate, pendulous ; lid conico-hemispheric, obtuse.”

Hab. In the bog in Haiden-dean, amongst *Hypna*, but not in fruit.

11. *B. ligulatum*, stems dendroidal, branched ; leaves long, undulate, linear-oblong, obtuse, the nerve excurrent, the margins thickened and toothed ; fruitstalks often aggregate ; capsule ovate, pendulous ; lid conical.

Hab. Woods and shaded banks, plentiful, but rare in fruit, a state in which Mr Baird has gathered it near Swinton.

“ The herbs in the meadows,” says St Pierre, “ often imitate the figure of the trees in the forests ;” and fancy may readily trace in this diminutive moss of our woods, the form of the princely palms of tropical climes.

12. *B. roseum*, stem simple, bare below ; leaves crowded above, rosaceous, obovate, acute, serrated towards the point, the nerve excurrent ; “ capsule oblong-ovate, pendulous ; lid conical, short.”

Hab. On banks and heaths. Near Hudshead, &c. but never found in fructification.

13. *B. hornum*, stems simple, elongate, clavate ; leaves erect, lanceolate, with a thickened strongly toothed margin, the nerve reaching the point ; fruitstalks $1\frac{1}{2}$ inch ; capsule oblong-ovate, pendulous ; lid hemispherical, mucronulate.

Hab. Under moist shelving rocks, and on the stumps of old trees, in dense tufts, common. Spring.

14. *B. nutans*, stems branched with innovations ; leaves erect, narrow-lanceolate, strongly nerved, serrated towards the point ; fruitstalks 2 inches ; capsule obovate, pendulous.

Hab. On moors, in pits where water has stood during part of the year, not uncommon. Spring.

17. FUNARIA.

1. *F. hygrometrica*, stems very short, tufted ; leaves ovate, apiculate, concave, entire, cellular ; fruitstalks wavy ; capsule pear-

shaped, pendulous; calyptra swollen and angled at the base, with a long beak tipped with a bristle.

Hab. On walls, banks, and heaths. Spring.

DILLENIIUS remarks that this moss “*præ aliis gaudet locis carbonariis et ubi præcedentibus annis ignes fuerunt.*” Thus it springs up, in company with *Didymodon purpureum*, wherever the whins and heath have been burnt down on our moors; and its luxuriance and vast profusion in these places is very remarkable.

18. ORTHOTRICHUM.

• *Fringe of the capsule without ciliary processes.*

1. *O. anomalum*, stems erect, branched; leaves spreading, lanceolate, erect when dry; fruitstalks exserted; capsule ribbed; fringe of 8 double teeth; calyptra slightly pilose.

Hab. On rocks and stones.

2. *O. cupulatum*, stems erect, branched; leaves spreading, lanceolate, erect when dry; fruitstalks not raised above the leaves; capsule ribbed; fringe of 16 double teeth; calyptra slightly pilose or naked.

Hab. On stones at the sides of *waters* and rivulets, frequent.

3. *O. Drummondii*, stems creeping; leaves lanceolate, crisped when dry; fruitstalks exserted; capsule long, clavate, contracted at the aperture, furrowed when mature; lid with a long beak; fringe of 16 reflexed teeth; calyptra very pilose.—GREVILLE, *Crypt. Fl.* tab. 115.

Hab. On trees. On the trunks of alder below Langleyford, Northumberland.

This is very distinct from either of the preceding, but much resembles *Or. crispum* described below. The leaves are soft, and yellowish-green. The specific name commemorates the zealous botanist who accompanied Captain FRANKLIN on his second journey to the shores of the Polar Sea, and who has again departed on an exploratory botanical excursion to the north-west coast of America. His account of a journey made into the Rocky Mountains, the critic has remarked, “is extremely interesting, as shewing the hardships to which these ‘cullers of

simples' voluntarily expose themselves, for the sake of adding one or two new specimens of plants to the 30,000 or 40,000 species already known. Thus, in the midst of snow, and without a tent, sheltered only from the inclemency of the weather by a hut built of the branches of trees, and depending for subsistence from day to day on a solitary Indian hunter, 'I obtained,' says the amiable and enthusiastic Mr DRUMMOND, 'a few mosses; and, on Christmas day, I had the pleasure of finding a very minute *Gymnostomum*, hitherto undescribed.' We shall not, we hope, be classed with those who see nothing but food for merriment in such devotion—in the true heroism of science."—*Quart. Rev.* xxxviii. 352.

* * *Fringe with ciliary processes.*

4. *O. crispum*, stems erect, branched; leaves narrow-lanceolate, crisped when dry; fruitstalks much exserted, thickened upwards; capsule furrowed when mature; ciliary processes 8; calyptra very pilose.

Hab. On trees in deans, common.

Orth. *Bruchii* and *crispulum* of some foreign botanists are common varieties of this species.

5. *O. pulchellum*, stems erect, short; leaves spreading, narrow-lanceolate, somewhat crisped when dry; fruitstalks exserted; capsule furrowed; ciliary processes 16; calyptra scarcely pilose.—WINCH, *Guide*, ii. 23.

Hab. On trees, in neat tufts. On hazels in Longridge-dean. Wooded banks of the Tweed above Lady-kirk.

This, the most elegant of the genus, is generally said to have been discovered by Mr BRUNTON; but his specimens were communicated by Mr WINCH, who, at the time, was aware of their belonging to an undescribed species.

6. *O. affine*, stems erect, branched; leaves spreading, lanceolate, erect and close when dry; fruitstalks not raised from amongst the leaves; capsule cylindrical, furrowed; ciliary processes 8; fringe reflected; calyptra sub-pilose; lid tapered gradually into the beak.

Hab. On trees and on stones, common.

7. *O. rupinicola*, stems erect, branched; leaves broadly lanceolate, somewhat spreading, erect when dry; fruitstalks not raised

from amongst the leaves; capsule ovate, ribbed half-way down; ciliary processes 3; fringe spreading; lid flattened with a straight central beak; calyptra very pilose.—GREV. *Fl. Edin.* 248.; *et Fl. Crypt.* tab. 105.

Hab. On rocks. On the craigs above Easington-house below Belford. At Ord-wheel, Berwickshire, plentiful. I have specimens also from Mr BAIRD, who probably collected them near Netherbyres.

8. *O. striatum*, stems erect, branched; leaves patent, lanceolate, slightly twisted when dry; capsule sessile, ovate, smooth; ciliary processes 16; calyptra furrowed, somewhat pilose.

Hab. On trees in woods, less frequent than *Or. affine*, which it much resembles.

The *Orthotricha* are peculiar in their habit, and have much mutual resemblance. They grow in little perennial tufts, which are of a dark green when placed on stones, but when on trees more commonly of a yellow-green colour. Their leaves are very minutely cellular, lanceolate, entire, and somewhat revolute at the margins. Their capsules are erect, cylindrical, very copiously produced, and to be found at all seasons of the year, the old in general being intermixed with those which are advancing towards maturity.

19. POLYTRICHUM.

* *Calyptra pilose.*

1. *P. communé*, stem simple; leaves spreading, rigid, subulate, serrated; capsule erect, square, with an evident apophysis; lid with a short curved point.

Hab. On moors, common. June.

The stems of this fine moss vary from 2 to 12 inches in height, according to the greater or less moisture of the station in which it grows; and in the smaller specimens the margins of the leaves are often pellucid, and the apophysis of the capsule indistinct. These constitute the *P. attenuatum* of many botanists.

In this country, mattresses, superior to those of straw, are sometimes made with this *Polytrichum*; and we have seen door-mats, and very neat brushes made of the luxuriant

stems collected from bogs. When well combed and dressed, says Mr WHITE, in his Natural History of Selborne, "and divested of its outer skin, it becomes of a beautiful bright chesnut colour; and, being soft and pliant, is very proper for the dusting of beds, curtains, carpets, hangings, &c. If these besoms were known to the brush-makers in town, it is probable they might come much in use for the purpose above mentioned." To the Laplanders its services are greater, for it affords them "bed and bedding." They choose the starry-headed plants, out of the tufts of which they cut a surface as large as they please for a bed or bolster, separating it from the earth beneath; and although the shoots are scarcely branched, they are nevertheless so entangled at the roots as not to be separable from each other. This mossy cushion is very soft and elastic, not growing hard by pressure; and if a similar portion of it be made to serve as a coverlet, nothing can be more warm and comfortable. 'Mollissimus est hic lectus cujus stragula undique ambiunt corpus et ad illud sese ubique applicant; calidissimus deinde est, ut virentis vegetabilis grati odoris, nec pediculos, pulices, cimices, scabiem, luem, aliudque contagium innocenti corpori adfert, nec plumulis undique obvolitantibus irresolubilibusque, cum inspiratione, pulmones infarcit phthisinque generat, sed lassum corpus molli grataque requie reficit.' I have often, continues LINNÆUS, made use of it with admiration; and if any writer had published a description of the simple contrivance, which necessity has taught the Laplanders, I could almost imagine that our counterpanes were but an imitation of it. They fold this bed together, tying it up into a roll that may be grasped by a man's arms, which if necessary, they carry with them to the place where they mean to sleep the night following. If it becomes too dry and compressed, its former elasticity is restored by a little moisture."

2. *P. piliferum*, stem simple, short; leaves rigid, awl-shaped, entire, pointed with a pellucid hair; capsule obtusely quadrangular, with an apophysis; lid with a curved point.

Hab. On earth-capt dikes and heaths, frequent. April.

3. *P. juniperinum*, stem simple; leaves rigid, awl-shaped, with entire involute margins, apex slightly serrate; capsule quadrangular, with a depressed apophysis; lid with a short conical point.

Hab. On dry heaths. Near Ord-Wheel, Berwickshire, &c. Spring.

4. *P. alpinum*, stem branched ; leaves rigid, lanceolate-subulate, with serrated nearly plane margins ; capsule ovate, with an indistinct apophysis ; lid with a subulate point.

Hab. On Cheviot, Winch. June.

5. *P. urnigerum*, stem branched, fastigiate ; leaves erecto-patent, lanceolate, serrated, upper ones glaucous-green ; fruitstalks $1\frac{1}{2}$ inch ; capsule erect, cylindraceous, without an apophysis ; lid with a short incurved point.

Hab. Roadside between Foulden and Hutton-Mill, plentiful, Rev. A. Baird. Dec.

This moss rarely occurs in a station so little elevated, the above being not more than 100 feet above the level of the sea.

6. *P. aloides*, stem short, simple ; leaves rigid, linear-lanceolate, with plane serrated margins ; capsule cylindraceous, nearly erect, without an apophysis : lid with a curved subulate point.

Hab. Moist gravel banks on heaths, not uncommon. On a bank near Renton Inn in great plenty and perfection. Winter.

The banks on which this species grows are often partially covered with a green velvet-like layer of vegetation, which the magnifier discovers to consist of irregularly branched filaments, obscurely jointed like a *Conferva*. It is in fact the *Conferva velutina* of some botanists, (*Dillw. Conf. tab. 77.*), but proved, by Dr DRUMMOND, to be nothing more than *P. aloides* in its earliest stage. The *Conferva velutina* of SMITH in *Eng. Botany* may be different, and possibly a perfect plant.

7. *P. nanum*, stem very short, simple ; leaves rigid, linear-lanceolate, rather obtuse, serrated towards the end ; capsule subglobose, nearly erect, without an apophysis.

Hab. Moist gravel banks, frequent. Summer.

• • *Calyptra naked.*

8. *P. undulatum*, stem nearly simple ; leaves membranous, lanceolate, undulate, plane, serrated, crisped when dry ; capsule cernuous, cylindrical ; lid subulate.

Hab. Woods and hedge banks, very common, producing fruit copiously in winter and early spring.

20. TORTULA.

* *Leaves with hair-like points.*

1. *T. muralis*, stems short, simple; leaves linear-oblong, patent, pointed with a smooth hair; capsule cylindraceous; lid conical, acuminate.

Hab. On walls and stones in roundish tufts. Winter.

2. *T. ruralis*, stems elongated, branched; leaves ovate, oblong, keeled, recurved, pointed with a serrulate hair, upper ones stellate; capsule ovate-cylindraceous; lid subulate; teeth of the fringe united below into a tube.

Hab. On old thatched roofs, and on the sandy sea-shore from Spittal southwards. Spring.

When on roofs, this moss grows in large cushion-like tufts, but in extensive even patches of a bright yellowish-green colour on our links, where, however, it never produces any fruit.

* * *Leaves without hair-like points.*

3. *T. subulata*, stems very short; leaves large, oblong-lanceolate, apiculate; capsule cylindrical, long, slightly curved; lid subulate.

Hab. On banks and earthen dikes, in bright green patches or tufts, common. Spring.

4. *T. unguiculata*, stems branched; leaves lanceolate, obtuse, mucronate, the margins nearly plane; capsule oblong; lid rostrate, nearly as long as the capsule.

Hab. On stone and earth walls, in brownish tufts, common. Spring.

5. *T. fallax*, stems elongated, branched; leaves lanceolate-subulate, patent or recurved, their margins reflexed; capsule oblong; lid rostrate, nearly as long as the capsule.

Hab. On moist clay banks.

6. *T. revoluta*, stems diffusely branched; leaves straight, lanceolate, acuminate, with revolute margins, perichæatial ones nerveless, convolute; capsule ovate, with a short conical lid.—*T. nervosa*, Sm. Comp. 171.

Hab. On banks, rare. Banks above Newmills. Spring.

7. *T. convoluta*, stems short; leaves lanceolate, rather obtuse, non-apiculate, perichaetial ones nerveless, acute, convolute and sheathing; capsule oblong; lid inclined, subulate, nearly as long as the capsule.

Hab. On banks, rare, in conspicuous soft even yellow-green patches. On a gravelly bank on Lamberton Moor, by the road side, abundant. Spring.

Very distinct from the preceding. Stems slender, branched with innovations. Fruitstalks long, slender, pale yellow, arising from amongst the new and barren branches.

21. DIDYMODON.

1. *D. purpureum*, stems erect, scarcely branched; leaves lanceolate, acute, keeled, with entire recurved margins; capsule elliptical, slightly curved, furrowed when dry; lid short, conical. —*Dicranum purpureum*, Sm. *Fl. Brit.* 1217.

Hab. On walls, and more abundantly on dry heathy bare places in moors, in wide brownish tufts. Spring.

2. *D. trifarium*, stems erect, simple, or branched with innovations; leaves rather distant, somewhat trifarious, concave, lanceolate, entire; capsule erect, oblong-ovate; lid subulate, rather long.

Hab. Moist clay banks, frequent in this neighbourhood on the coast north of the Tweed. On a wet part of the wall between the Old Castle and Spring-gardens. Spring.

On our sea banks between Spittal and Scrammerston, there occurs in abundance a very small moss, which at first examination I considered to be a variety of *D. trifarium*. It resembles the small specimens sent from Ireland by Dr DRUMMOND to the authors of the *Muscologia Britannica*, and delineated in tab. xx. f. 1. of that work; but Mr ARNOTT could not discover more than 16 teeth in the fringe on the specimens I sent him; nor can I, after a careful re-examination of that part, observe more. The moss appears, therefore, to be a species of *Weissia*, but not referrible to any described in any work on British botany to which I have access.

22. DICRANUM.

* *Leaves inserted on all sides of the stem.*

1. *D. scoparium*, stems elongated; leaves sickle-shaped and inclined to one side, subulate, canaliculate; capsule cylindraceous, arched; lid with a long beak.

Hab. In deans and on moors, common. 7/

This fine moss is very generally found on rocks, or large stones, which it covers partially with a thick soft elastic cushion. It produces fruit in winter, and though the stalks are in general single, yet specimens with 3 or more from the same sheath are not rare. These constitute the *Dic. majus* of SMITH, *Fl. Brit.* 1202.

2. *D. undulatum*, stems elongated; leaves straight, nearly plane, long, lanceolate-acuminate, serrated at the points, transversely undulate when dry; "capsule cylindraceous, cernuous; lid with a long beak."

Hab. Lamberton Moor, plentiful. Spring. 7/

3. *D. glaucum*, stems branched, fastigiate; leaves ovate-lanceolate, straight, somewhat convolute, nerveless, entire, reticular; capsule ovate, cernuous; lid beaked.

Hab. On moors in moist places, in dense masses of a straw colour, similar to that of the *Sphagna*. 7/

4. *D. crispum*, stems very short, simple; leaves setaceous, dilated at the base, spreading, flexuose, entire; capsule ovate, suberect; lid with a long beak.

Hab. On the sides of drains cut through turfy bogs, not common. Below Shoreswood Hall, Dr Thompson. In the dean below Allerton Mill. July. 7/

5. *D. varium*, stems short; leaves narrow, lanceolate, entire, rigid, inclined to a side; capsules ovate, subcernuous; lid conical, acuminate.

Hab. Moist clay banks, in grass-green patches, not uncommon. Spring. ☉

6. *D. heteromallum*, stems slightly branched; leaves subulate, nearly entire, sickle-shaped, and inclined to one side; capsule ovate, subcernuous; lid with a long beak.

Hab. On moist banks in deans, and turf dikes, frequent. Spring.

7. *D. squarrosus*, stems elongated, slightly branched; branches erect, often fascicled; leaves from a broad sheathing base, broadly lanceolate, acute, concave, much recurved, and directed to every side, crisped when dry; "capsule ovate, subcernuous; lid rostrate."

Hab. Wet bogs, in even matted patches. Haiden Dean, plentiful, but not in fruit. 7/

The short regularly revolute leaves with which the slender stem is clothed, give to this species an appearance of considerable elegance. The leaves are described as entire by SMITH, and are so represented in the *Muscol. Brit.*, but to us they appear serrulate towards the point.

8. *D. pellucidum*, stems branched, tufted; leaves spreading, lanceolate, somewhat undulate, nerved throughout, the upper half toothed; fruitstalks not 1 inch; capsule ovate, subcernuous; lid rostrate.

Hab. On stones at the sides of burns, in shaded sandy places, plentiful. Spring. 7/

9. *D. polycarpum*, stems tufted, rather short; leaves linear-lanceolate, concave, entire, crisped when dry; fruitstalks $\frac{1}{4}$; capsule ovate, erect, or slightly inclined; lid half as long as the capsule, pointed, inclined.

Hab. On rocks, in light green tufts. Humbledon Dean, above Wooler. Spring.

* * *Leaves distichous compressed.*

10. *D. bryoides*, stem simple; leaves elliptic-lanceolate, entire, bifarious, the parichætical ones like those of the stem; fruitstalks terminal; capsule erect; lid conical, acuminate.

Hab. Moist hedge banks, and in woods, frequent. Spring.

MUNGO PARK found this pretty little species in the interior of Africa, and it appears to be the moss alluded to in the following passage, which, though often quoted, is too much to my purpose to be here omitted. "Whichever way I turned," says the traveller, "I saw myself in the midst of a vast wilderness, in the depth of the rainy season, naked and alone; surrounded by savage animals, and by men

still more savage. I was 500 miles from any European settlement. All these circumstances crowded at once on my recollection, and I confess that my spirits began to fail me. I considered my fate as certain, and that I had no alternative but to lie down and perish. The influence of religion, however, aided and supported me. I reflected that no human prudence or foresight could possibly have averted my present sufferings. I was indeed a stranger in a strange land, yet I was still under the protecting eye of that Providence who has condescended to call himself the stranger's friend. At this moment, painful as my reflections were, the extraordinary beauty of a small moss, in fructification, irresistibly caught my eye. I mention this, to show from what trifling circumstances the mind will sometimes derive consolation; for, though the whole plant was not larger than the top of one of my fingers, I could not contemplate the delicate conformation of its roots, leaves, and capsule, without admiration. Can that Being, thought I, who planted, watered, and brought to perfection, in this obscure part of the world, a thing which appears of so small importance, look with unconcern upon the situation and sufferings of creatures formed after his own image? Surely not! Reflections like these would not allow me to despair. I started up, and, disregarding both hunger and fatigue, travelled forwards, assured that relief was at hand; and I was not disappointed."

—————"To apprehend thus,
Draws us a profit from all things we see."

11. *D. adiantoides*, stems branched; leaves lanceolate, serrulate at the point, those of the perichaetium ovate, slightly convolute, pointed; fruitstalks from near the middle of the stem, flexuose; capsule erect; lid long, subulate.

Hab. In wet bogs amongst moss. Lamberton Moor, &c. Spring. 2/

12. *D. taxifolium*, stems simple, tufted; leaves ovate-lanceolate, entire; perichaetial ones ovate, sheathing, involute, pointed; fruitstalks inserted at the very base of the stem; capsules drooping; lid long, subulate.

Hab. Moist clay banks in woods. Near Netherbyres,
Rev. A. Baird. New-water-haugh plantation. Spring.
2/

23. WEISSIA.

1. *W. controversa*, small ; stems nearly simple ; leaves linear-subulate, straight, crisped when dry, their margins incurved ; capsule elliptical ; lid subulate, curved.—*Grimmia controversa*, SM. *Fl. Brit.* 1187.

Hab. Banks and cultivated fields, in irregular patches, common. Early spring. 7/

2. *W. verticillata*, stems branched ; leaves narrow-lanceolate, straight, nearly flat, rather flaccid ; capsule ovate, erect ; lid subulate, curved.—*Grimmia verticillata*, SM. *Fl. Brit.* 1191.

Hab. On rocks over which water trickles. On wet rocks at Eyemouth and Coldingham shores, Rev. A. Baird. In the dean at Twizel Bridge, N. D.

Grows in very compact masses of a grass green on the surface, but the lower parts of the stems are matted together with a white calcareous incrustation. It does not produce fruit in the above stations, but I have had the pleasure of gathering it in a very perfect state in the romantic dean at Twizel-house, the seat of P. J. SELBY, Esq. which is only a short distance beyond our limits.

3. *W. recurvirostra*, stems simple or branched ; leaves patent, linear-subulate, carinate, entire, strongly nerved ; fruitstalks $\frac{3}{4}$ ths of an inch high ; capsule cylindraceous, slender, erect, with a conical slightly inclined lid.—*Grimmia recurvirostra*, SM. *Fl. Brit.* 1190.

Hab. On sandy banks. On a moss-grown wall at the roadside, a little west of East Ord, abundant. Winter.

In habit resembles the *Tortula*, and is altogether very much like some of the varieties of *Tortula fallax*.

24. CINCLIDOTUS.

1. *C. fontinaloides*, dark-green ; stem much branched ; leaves lanceolate, entire, strongly nerved, crisped when dry ; capsules oblong, subsessile, on short lateral branches.—*Trichostomum fontinaloides*, SM. *Fl. Brit.* 1248.

Hab. On stones and wood, in streams, not rare.

25. TRICHOSTOMUM.

* *Leaves with diaphanous points.*

1. *T. lanuginosum*, stems elongated, somewhat pinnate; branches short; leaves lanceolate-subulate, their long diaphanous points toothed; fruitstalks short, on lateral branches; capsule ovate; lid subulate.

Hab. Abundant on all our higher moors, where it is conspicuous from its hoary foliage.

2. *T. canescens*, stems erect, irregularly branched; leaves ovate-lanceolate, recurved, channelled, the diaphanous points obscurely serrate; fruitstalks 1 inch, flexuose; capsule ovate; lid long, subulate.

Var. 1. Branches erect, longer.—*T. canescens*, SMITH.

Var. 2. Branches very short, patent.—*T. ericoides*, SMITH.

Hab. On all the Lammermuirs, plentiful; also on Lamber-ton Moor. *Var.* 2. is the least common.

3. *T. heterostichon*, stem cæspitose, irregularly branched; leaves lanceolate-acuminate, concave, entire; capsule cylindraceous, with a short fringe; lid long, subulate.

Hab. On whinstones in moors, frequent: also on sand-stone rocks in Longridge Dean.

* * *Leaves never diaphanous at their points.*

4. *T. aciculare*, stems somewhat erect, branched; leaves broadly-lanceolate, obtuse, with revolute margins, the apex obscurely serrate; capsule ovate-oblong; lid subulate.—*Dicranum aciculare*, SM. *Fl. Brit.* 1212.

Hab. On large stones in rivers and burns, not rare in our moor and upland districts. Spring.

5. *T. polyphyllum*, stems branched, tufted; leaves lanceolate-subulate, their margins recurved, coarsely serrated above, much crisped when dry; capsule elliptical; lid rostrate.—*Dicranum polyphyllum*, SM. *Fl. Brit.* 1226.

Hab. On rocks in the lower parts of Lumsden Dean, a station less remarkable for its many fine plants, than for the rugged grandeur of its scenery. June.

Grows in cushion-like tufts of a dark but pleasant green. Stems simple or branched, about an inch high, densely clothed with the long leaves, which are black on the under part, and green only towards the top. Fruitstalks in our specimens $\frac{1}{4}$ -inch long, pale coloured, as is likewise the neat elliptical capsule, which has a pretty crimson fringe to its contracted aperture.

26. GRIMMIA.

1. *G. apocarpa*, stems tufted, much branched; leaves patent, ovate-lanceolate, their margins revolute, entire; capsules ovate, immersed; lid with a short beak.

Hab. On trees and rocks, common. Spring.

A species subject to considerable variation in size and habit. The capsules sit amongst the leaves, but are rendered conspicuous by their bright scarlet fringe.

2. *G. maritima*, stems short, pulvinate; leaves lanceolate, entire, crisped when dry, the nerve of the perichaetial ones excurrent; capsules urceolate, immersed; lid with a short beak.

Hab. On rocks on the coast of Berwickshire, in several places. Plentiful at Hudshead, N. D., and on the Farn Islands. October.

3. *G. pulvinata*, stems short, pulvinate; leaves lanceolate, with a white hair-like point; fruitstalks curved; capsule ovate, striated; lid conical, acuminate.—*Dicranum pulvinatum*, Sm. *Fl. Brit.* 1214.

Hab. On stones and dikes, very common, in cushion-like tufts of a silvery green colour.

The *G. ovata* grows on loose stones near the summit of the most eastern of the Eildon hills, and will probably be found in the west of Berwickshire.

27. ENCALYPTA.

1. *E. vulgaris*, stem short, simple; leaves broadly lanceolate, entire, strongly nerved, somewhat crisped when dry; capsule cylindrical, smooth; calyptra entire at the base.

Hab. On earth-capt dikes, not uncommon. Dikes on the Etal-road above Prior-house, Dr Thompson. Frequent

near Eyemouth, Rev. A. Baird. Near Mordington-house, abundant, &c. Spring.

28. SPLACHNUM.

1. *S. sphæricum*, leaves obovate, with a suddenly narrowed rather long point, slightly serrated; apophysis ovate-globose, wider than the capsule.—*S. gracile*, SM. *Fl. Brit.* 1174.

Hab. On Cheviot, Dr Thompson. August.

Stems about $\frac{1}{4}$ -inch long. Leaves straw-coloured, loosely reticulate, with a strong nerve running beyond their rounded apex, and forming a narrow point. Fruitstalks about 2 inches long, slender, flexuose, yellowish or reddish-brown; apophysis dark-brown, with a lighter coloured capsule.

29. TETRAPHIS.

1. *T. pellucida*, stems slender; leaves alternate, ovate-acute, entire, the nerve disappearing below the point, "those of the perichaetium lanceolate; capsule cylindrical."

Hab. Dry banks in woods, and about the trunks of old trees, not common. Murton Craigs, plentiful.

Grows in irregular patches of a pale and pleasant green colour. Our specimens have no capsules, but are all "terminated by cup-shaped receptacles, consisting of broadly obcordate leaves, in the centre of which are fixed, by a short footstalk, small spherical bodies, bearing an exact analogy to the anthers of *Jungermannia*."

30. ANICTANGIUM.

1. *A. ciliatum*, stem much branched, diffuse; leaves ovate, nerveless, with diaphanous serrulate points; capsules subsessile, campanulate.—*Gymnostomum ciliatum*, SM. *Fl. Brit.* 1168.

Hab. On rocks in subalpine districts. Plentiful on Lamberton Moor and the Lammermuirs, growing on whinstones in hoary tufts.

31. GYMNOSTOMUM.

1. *G. truncatulum*, small; stem simple; leaves obovate, apicu-

late, entire, nearly plane; capsule oval, truncated, with a wide orifice: lid obliquely rostrate.

Hab. On banks and earth-capt dikes, in irregular even patches, common. Winter.

HASSELQUIST having observed this plant growing in great abundance upon the walls of Jerusalem, conjectures it may be the hyssop of the Scriptures;—Solomon “spake of trees, from the cedar tree that is in Lebanon even unto the hyssop that springeth out of the wall.”

In stubble-fields in autumn, I have gathered a little moss very nearly allied to *Gym. truncatulum*, but perhaps distinct from it. The stem is simple, very short, with longer barren shoots intermixed; leaves elliptic-lanceolate, concave, obscurely toothed at the point, the nerve non-excurrent. My specimens are not sufficiently mature, but Mr ARNOTT, who did me the favour of examining them, is inclined to refer them to *Gym. rufescens*.

2. *G. ovatum*, small; stem short, simple; leaves ovate, erect, concave, piliferous, their nerve furnished with a granuliferous membrane; capsule ovate; lid rostrate.

Hab. On earth-capt dikes, frequent in this neighbourhood. Winter.

It is curious to notice how gay these little mosses are on every wall top during the winter months and in early spring, almost or perhaps the only things which seem to enjoy the clouds and storms of the season. They choose the most exposed stations, spread out their leaves, and push up their glossy capsules amid rains, frost, and snow; and yet there is nothing in their tender and loose structure, from which we could *a priori* infer their capability of resisting influences so generally destructive to vegetation. But so it is: the more simple the organization of plants, the stronger is their tenacity of life; and its phenomena are exhibited and called into play by stimulants not only very feeble, but apparently the very reverse of those necessary to excite plants of a higher order. Thus mosses and lichens, overstimulated by heat and dryness, wither away in summer, but vegetate freely at a season when there is no other vegetation, and when their humble fronds cannot be overshadowed by a ranker growth.

3. *G. pyriforme*, stem simple, very short; leaves grass-green, ovate, acuminate, concave, serrated at the top; fruitstalk stout; capsule roundish-obovate, large; lid convex, shortly rostrate.

Hab. Wet sides of ditches, frequent. Spring.

4. *G. tenue*, slender; stem scarcely any; leaves entire, outer ones very short, ovate-lanceolate, inner ones linear-lanceolate, obtuse; fruitstalk rather long; capsule oblong; lid with a short straight beak.—*Dicranum cylindricum*, SM. *Fl. Brit.* 1221. *Gymnostomum paucifolium*, SM. *Comp.* 161.

Hab. Sandstone rocks, rare. On a rock at the side of the footpath leading through the plantation above Ord-mill. July.

32. SPHAGNUM.

1. *S. obtusifolium*, branches tumid, deflexed; leaves ovate, obtuse, concave.—*S. latifolium*, SM. *Fl. Brit.* 1145.

Hab. Bogs in moors, common. July, August.

2. *S. acutifolium*, branches slender, tapered, weeping; leaves ovate-lanceolate, crowded.—*S. capillifolium*, SM. *Fl. Brit.* 1146.

Hab. Bogs with the preceding, and equally common. The leaves are very often of a reddish-pink colour. July.

3. *S. cuspidatum*, branches attenuated; leaves lanceolate-subulate, lax.

Hab. Peat bogs, generally growing in water. In peat pits on Cheviot, and on Coldingham Moor, abundant, but not in fruit.

The *Sphagna* grow in compact elastic knolls, and by their decomposition contribute greatly to the formation of peat. Their stems are about a span in length, branched, and densely clothed with soft nerveless beautifully reticulated leaves, of a straw-yellow colour, and which distinguish the genus from almost all other mosses. The Laplanders, Icelanders, and the North American Indians, use the *Sphagna* for lining their neat and curious cradles. The moss forms a soft elastic bed, which absorbs moisture very readily, and affords such a protection from the cold of a rigorous winter, that its place would be ill supplied by cloth. Mr W. CURTIS obtained the reward of the Society of Arts for his valuable application of these mosses to the packing of young trees for exportation.

33. PHASCUM.

1. *P. cuspidatum*, minute; stem simple; leaves ovate-acuminate, the nerve reaching to or beyond the point, the upper ones connivent, concealing the broadly elliptical nearly sessile capsule.

Hab. On sandy banks and earth dikes, in even patches, not uncommon. Spring.

2. *P. subulatum*, leaves erect, subulate, dilated at the base, entire.

Hab. On sandy banks, in dense tufts. Ordwheel. Spring.

Stem simple, tufted, 3 or 4 lines high; leaves erect, the upper ones long, and overtopping the capsule, yellowish-green; capsule shortly stalked, ovate-globose, covered with a glossy golden sort of network; lid curved, short; seeds very numerous, small, round.

3. *P. serratum*, very minute, stemless; leaves lanceolate, nerveless, reticulated, serrated, overtopping the globular reddish-brown capsule.

Hab. Corn fields of a light peat soil, intermixed with *Gymnostomum truncatulum*, not common. Autumn.

So minute is this curious moss, that it will probably only attract the notice of the cryptogamist while examining, with attention, the more conspicuous plants amongst which it grows. It is furnished at the base with branched conferva-like shoots, the use and nature of which seem somewhat doubtful.

34. ANDRÆA.

1. *A. rupestris*, stems branched; leaves ovate, gradually acuminate, entire, nerveless.—HOOKER, *Lin. Trans.* x. 391, t. 31, f. 2.

Hab. On rocks, growing in short rigid tufts of a dark-brown colour. At Ordwheel, Berwickshire. Near the summit of Hedge-hope, Northumberland.

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Obs.—In this Order I have followed the nomenclature of Drs. HOOKER and TAYLOR's *Muscologia Britannica*, 8vo, Lond. 1818, —a work indispensably necessary to the student of British mosses.

ORDER V.

HEPATICÆ.

“ Do not depreciate any pursuit which leads men to contemplate the works of their Creator ! The Linnean traveller who, when you look over the pages of his journal, seems to you a mere botanist, has in his pursuit, as you have in yours, an object that occupies his time, and fills his mind, and satisfies his heart. It is as innocent as yours, and as disinterested,—perhaps more so, because it is not so ambitious. Nor is the pleasure which he partakes in investigating the structure of a plant less pure, or less worthy, than what you derive from perusing the noblest productions of human genius.”—SOUTHEY.

35. JUNGERMANNIA. *Capsule* solitary, raised on a stalk, globular, bursting into 4 valves.
36. ANTHOCEROS. *Capsule* solitary, raised on a stalk, long and linear, 2-valved, with a central *column* to which the seeds are attached.
37. MARCHANTIA. *Capsules* several, attached to the inferior surface of an umbrella-like *capitulum* or *receptacle* raised on a stalk.
38. RICCIA. *Capsule* sessile, globular, not splitting into valves, surmounted by a short tube.

35. JUNGERMANNIA.

As I find it impracticable to give, by words, an accurate idea of the forms of the leaves of *Jungermannia*, on which the deter-

mination of the species principally depends, I have accompanied my descriptions with outline figures, taken, in every instance, from specimens collected in Berwickshire. They will enable the student, with facility, to determine the species, which are less numerous than I had anticipated; and the more experienced botanist to judge of the accuracy of my synonymy. The figures in *English Botany*, so far as I remember, are of little value; and Dr HOOKER's *Monograph* of the genus, so celebrated for its completeness, accuracy, and beauty, I have never seen.

* *Leafy and stipulate.*

† *Leaves imbricated.*

1. *J. Tamarisci*, stem decumbent, bipinnate; leaves brown, unequally 2-lobed, superior lobes roundish, the inferior minute, obovate, saccate; stipules ovate, emarginate. (Tab. v. Fig. 1.) LIGHTF. *Fl. Scot.* 782. HOOK. *Scot.* ii. 118. *J. tamariscina*, Eng. Bot. t. 2481.—Dill. *Musc.* t. 72. f. 31.

Hab. On rocks and heaths, common; and sometimes on trunks of trees in woods, in tufts of a dark brown colour.

The stem is slender, branched in a pinnated manner, decumbent or often nearly erect, but scarcely ever creeping. It appears never to produce fruit in this neighbourhood. It is probably the *J. tamariscifolia* of WITHERING, who, however, has mixed up its description with that of the following species.

2. *J. dilatata*, stem creeping, matted, irregularly branched; leaves alternate, unequally 2-lobed, lobes entire, roundish; stipules rounded, plane, emarginate; fruit terminal; calyx compressed, minutely tuberculate, and puckered at the mouth. (Tab. v. Fig. 2.) WITH. iii. 1074. LIGHTF. *Scot.* 781. HOOK. *Scot.* ii. 118. *J. tamariscifolia*, Eng. Bot. t. 1086. Dill. *Musc.* t. 72, f. 27. Loud. *Encyclop.* No. 14998.

Hab. On trees, in circular dense patches of a reddish or purplish-brown colour, common. Spring.

The stems are slender, and the specific name has reference

to a slight dilatation of the extremities of the branches, which is scarcely obvious even to a practised eye.

3. *J. platyphylla*, stem appressed, flattened, pinnate; leaves imbricate, distichous, unequally 2-lobed, entire, superior lobe large, roundish, inferior ones and the stipules ligulate; fruit lateral. (Tab. v. f. 3.) LIGHTF. *Scot.* 784. WITH. iii. 1075. HOOK. *Scot.* ii. 117. *Eng. Bot.* t. 798. *Loud. Encyclop.* No. 14987. *Dill. Musc.* t. 72, f. 32, 33.

Hab. At the roots of trees, and on rocks in woods, in imbricate patches of a dull deep-green colour.

The leaves are minutely areolar, and of a soft thickish texture. Their true form is detected with difficulty.

† † *Leaves bifarious; stem plane.*

4. *J. trilobata*, stem creeping, ascending, more or less branched; leaves bifarious, imbricated above and convex, ovate, the apex 3-toothed; stipules large, subquadrate, coarsely crenate. HOOK. *Scot.* ii. 116. (Tab. v. f. 21.)

Hab. Shaded woods. In the woods at Murton Craigs.

One of the largest species, approaching *J. asplenoides* in size and habit. The stem throws out, from the under side, numerous long filiform threads, which, besides the radicle fibres, are clothed with minute and distant leaves, much like those of *J. bicuspidata*, except that they are 3-toothed. The structure of the proper leaves is pre-eminently beautiful. Their cellular tissue forms a fine lace-work, the miniature meshes of which are somewhat circular, and each ornamented with a few spots or beads in their centre.

5. *J. bidentata*, stem creeping, sparingly branched; leaves 2-rowed, adnate, subquadrangular, the apex widely bifid; stipules lacinate; fruit terminal: calyx oblong. (Tab. v. fig. 4.) LIGHTF. *Scot.* 774. WITH. iii. 1065. *Eng. Bot.* t. 606. HOOK. *Scot.* ii. 116. GREV. *Fl. Edin.* 277. t. 1, f. 34. *Dill. Musc.* t. 70, f. 11. and 12.

Hab. Mossy banks, woods, &c., very common. Spring.

This species may often be observed creeping over the fronds of *Peltidea canina*. It is, in exposed situations, of a pale

yellow or straw colour, but in shaded woods, often of a grass-green:—the effect of shade in this instance, and on cryptogamous plants in general, being the reverse of that produced in phanogamous plants.

6. *J. Trichomanis*, stem creeping, simple or sparingly branched; leaves 2-rowed, adnate, semi-ovate, entire or slightly emarginate; stipules semilunate; fruit lateral. (Tab. v. Fig. 5.) LIGHTF. *Scot.* 769. HOOK. *Scot.* ii. 116. *J. scalaris*, WITH. iii. 1065. DILL. *Musc.* t. 31, f. 5. and 6.

Hab. On mossy rocks, and in tufts of *Sphagna*, frequent.

Depressed, grass-green, with obtuse leaves overlapping at their edges; but the variety found in tufts of *Sphagna* and other bog-mosses, resembles the preceding in the straw colour of its leaves, which are more widely set, more acute, and of a looser texture. Our figure is taken from this variety, which, in Berwickshire, is by much the commonest. The apex of the stem is sometimes lengthened out, and terminated with a cluster of pulverulent buds.

7. *J. heterophylla*, stem creeping, branched; leaves 2-rowed, adnate, subquadrangular, entire, or obtusely emarginate; stipules divided in 2–4 segments; fruit terminal; calyx ovate. (Tab. v. f. 6.) SPRENG. *Syst. Veg.* iv. 224. LOUD. *Encyclop.* No. 14980.

Hab. On the decayed stumps of trees. Our specimens were gathered by the Rev. A. Baird in the woods about Twizel. Winter.

Closely allied to *J. bidentata*, of which some have considered it a variety. The stipules are small, and not shewn in our figure, which is taken from a front view. The habitat above given is, perhaps, the most northern in which it has been found in this country, for *J. heterophylla* has not as yet been introduced into the *Flora Scotica*.

† † † *Leaves clasping the stem.*

8. *T. barbata*, stem creeping or erect, simple or branched near the top; leaves 2-rowed, vertical, inclining to one side, subquadrate, waved, and three or four lobed; stipules laciniate, some of the segments toothed. (Tab. v. f. 7.) HOOK. *Scot.* ii. 116. SPRENG. *Syst. Veg.* iv. 223. LOUD. *Encycl.* No. 14983.

Hab. In bogs on moors, sometimes growing in level-topped tufts, and sometimes intermixed with *Sphagna* and *Dicranum glaucum*: or in deans intermixed with *Dicranum scoparium*. Winter.

The stems are often $1\frac{1}{2}$ inch long, filiform, and generally branched near the top, the branches spreading and few in number. The leaves vary from a brownish colour to a deep grass-green, and, in the specimens examined by us, were always cut at the end into 3 equal acute segments. A variety more slender, and of a deeper brown colour, is sometimes met with, in depressed patches, on heath-covered rocks. Fig. *b*.

9. *J. scalaris*, stem ascending, simple; leaves patent, alternate, round, concave, entire; "stipules broadly subulate; fruit terminal: calyx immersed in the leaves." (Tab. v. fig. 8.) HOOK. *Scot.* ii. 115.

Hab. On heaths, very common. Nov.

When growing in bogs, I have seen the stems rather more than an inch high, but in a drier situation they are much less. The species is very common on moors, growing in patches, or intermixed with other mosses.

* * *Leafy and exstipulate.*

+ *Leaves 2-lobed, the segments unequal, conduplicate.*

10. *J. nemorosa*, stem erect, dichotomous or simple; leaves 2-rowed, patent, convex, toothed, the lobes unequal, the larger ovate, the smaller somewhat heart-shaped; fruit terminal; calyx oblong, incurved, compressed, (Tab. v. f. 9.) HOOK. *Scot.* iii. 114. *S. purpurea*, LIGHTF. *Scot.* 778. *Eng. Bot.* t. 1023, and *J. resupinata*, t. 2437.

Hab. On banks and in woods, often intermixed with *Dicranum scoparium*, in tufts of a brownish green. Winter.

The lobes of the leaves are sometimes tipped with pulverulent clusters of buds.

11. *J. undulata*, stem erect, simple or sub-dichotomous, rigid; leaves 2-rowed, patent, convex, the lobes unequal, roundish, somewhat waved, entire or nearly so; calyx oblong; fruit terminal.

(Tab. v. f. 10.) HOOK. *Scot.* ii. 114. WITH. iii. 1069. LIGHTF. *Scot.* 776. *Eng. Bot.* t. 2251.

Hab. On moist rocks, by the sides of streams, and in bogs on moors.

Stem nearly 2 inches high, woody, purplish-brown, almost always simple. Leaves alternate, unilateral, brownish, the concave side looking downwards, small at the base of the stalk, and increasing in size towards the top. Some of the leaves, those near the top in particular, are occasionally serrated.

12. *J. albicans*, stems ascending, somewhat branched; leaves 2-rowed, the lobes very unequal, marked with a pellucid mesial line; the larger oblong, toothed near the apex, the smaller oval; fruit terminal; calyx cylindraceous, with a contracted pellucid aperture. (Tab. v. f. 11.) WITH. iii. 1070. LIGHTF. *Scot.* 777. HOOK. *Scot.* ii. 114. *Eng. Bot.* t. 2240. *Loud. Encyclop.* No. 14965. *Dill. Musc.* t. 71, f. 20.

Hab. Shaded banks in woods, and on heaths, common. Winter.

The leaves are of a rather thick and close texture, and in general of a dark grass-green, or brownish colour, so that the specific name appears inapplicable, unless it has some reference to some change induced by decay, or to the whitish line which runs through each leaf, an appearance produced by a greater laxity of the cellular texture of the part.

13. *J. complanata*, stems creeping, matted, branched; leaves biserial, imbricate, unequally 2-lobed, entire, superior lobe rounded, the lower ovate, appressed; fruit terminal; calyx oblong, with a truncate, entire aperture, (Tab. v. f. 12.) WITH. iii. 1073. LIGHTF. *Scot.* 780. HOOK. *Scot.* ii. 115. *Eng. Bot.* t. 2499. *Dill. Musc.* t. 72, f. 26.

Hab. On trees in pale or yellow green patches, common.

† † *Leaves simple, undivided.*

14. *J. asplenoides*, stem ascending, simple or sparingly branched; leaves large, alternate, bifarious, adnate, broadly ovate, obtuse, toothed; fruit terminal and lateral: calyx oblong, with a trun-

cate, subciliatè mouth. (Tab. v. f. 13.) WITH. iii. 1064. LIGHTF. Scot. 771. HOOK. Scot. ii. 112. DILL. MUSC. t. 69 f. 5 and 6.

Hab. On shaded banks, and in deans, common.

The largest and finest of our species. The leaves are often only partially toothed, and not rarely quite entire.

15. *J. lanceolata*, stem creeping, prostrate, plane; leaves 2-rowed, semi-amplexicaul, ovate, entire; fruit terminal; calyx oblong-pearshaped, cut. (tab. v. f. 14.) LIGHTF. Scot. 773. HOOK. Scot. ii. 112. DILL. MUSC. t. 70, f. 10.

Hab. On shaded banks, amongst *Jungermannia epiphylla* and *Marchantia polymorpha*, producing fruit in winter.

This, in habit, comes near *J. trichomanes*, but the leaves are greener, more dense in structure, and exstipulate.

+++ *Leaves simple, the apex more or less cleft.*

16. *J. emarginata*, stem erect, slender, simple; leaves 2-rowed, loosely imbricate, patent, obcordate, concave, emarginate. (Tab. v. Fig. 15.)—HOOK. Scot. ii. 112.

Hab. Heathy deans, on moist rocks, in tufts of a dark reddish-brown colour. Longridge Dean. Rocks at Ord-wheel.

The stems are scarcely an inch in height; the leaves brown, and minutely areolar. The specimens of *J. emarginata*, β . preserved in MOUGEOT and NESTLER'S *Stirpes Cryptogamæ*, are larger in every way than ours, and of a lighter brown colour; while those of *J. Funckii* are smaller, and the leaves, perhaps, more deeply divided at the apex. In other respects, the latter very closely resemble our specimens, but the species is not a native of Britain.

17. *J. ventricosa*, stem creeping, prostrate, somewhat branched; leaves 2-rowed, patent, square, concave, obtusely and broadly emarginated; fruit terminal; calyx oblong, the mouth contracted, plicated, toothed. (Tab. v. Fig. 16.)—HOOK. Scot. ii. 113.; LOND. ENCYCLOP. No. 14950.

Hab. On heaths intermixed with lichens.

The horns of the leaves are often tipped with a cluster of little

globular bodies, which, I presume, are analogous to the buds of phanogamous plants.

18. *J. excisa*, stem nearly simple, slender; leaves distant, patent, subquadrate, deeply emarginated; fruit terminal; calyx oblong, the mouth plicate, toothed. (Tab. v. Fig. 17.)—Hook. *Scot.* ii. 113.

Hab. In marshes on heaths, intermixed with other *Jungermanniæ*, plentiful. Winter.

Approaches the following species, but is a stouter plant, and much closer in its texture.

19. *J. bicuspidata*, stems procumbent, very slender, branched; leaves small, distant, alternate, patent, concave, the apex deeply divided into 2 equal acute segments; fruit terminal. (Tab. v. Fig. 18.)—LIGHTF. *Scot.* 775; WITH. iii. 1068; Hook. *Scot.* ii. 113; *Lond. Encyclop.* No. 14952.

Hab. On shaded banks, either in patches or straggling amongst other mosses, common.

Whole plant very loosely cellular.

20. *J. connivens*, stem slender, creeping, radicant, irregularly branched; leaves 2-rowed, small, loosely cellular, deeply lunated, the points converging; fruit on short branches near the base; calyx oblong-ovate, the mouth ciliated.—Hook. *Scot.* ii. 113; GREV. *Fl. Edin.* 274.

Hab. Marshes and moist heathy rocks. Murton Craigs. Nov.

There is no figure given of this species, for the plate was engraved before the plant came under our notice. It much resembles *J. bicuspidata*.

21. *J. pusilla*, stem creeping, radicular, branched; leaves 2-rowed, horizontal, square, undulate, very obtusely toothed: fruit terminal; calyx campanulate; capsule spherical, bursting irregularly. (Tab. v. Fig. 19.)—Hook. *Scot.* ii. 114; *Loud. Encyclop.* No. 14,958.

Hab. Moist clayey banks and fields, flowering late in autumn.

Grows in patches of a pleasant green colour. The fruitstalk

is very short, and seems to arise out of little branches which bud from the main stalk.

22. *J. byssacea*, stems very slender, filiform, depressed; leaves 2-rowed, very small, alternate, erecto-patent, the apex divided into two equal segments; fruit terminal. (Tab. v. Fig. 20.)—Hook. Scot. ii. 113.

Hab. Elevated heaths in exposed situations, in brown patches. Dirrington Law, Berwickshire.

Our specimens have smaller leaves than those preserved in MOUGEOT and NESTLER's useful collection; and they lie so close to the stem, that only a few of them can be seen to be bifid. It approaches very near to *J. bicuspidata*.

* * * *Frondose.*

† *Fronde broad.*

23. *J. epiphylla*, fronds procumbent, imbricate, obsoletely ribbed, smooth above, tomentose beneath, the margin waved and often sinuated; fruit arising from the superior part of the frond near the apex; calyptra exserted.—LIGHTF. Scot. 788; WITH. iii. 1061; Hook. Scot. ii. 118; DILL. Musc. t. 74. f. 41.

Hab. On wet dripping rocks, and moist shady banks by the sides of rivulets, common, and generally intermixed with *Marchantia polymorpha*. Spring.

“This plant has the habit of a *Marchantia*, but of a more tender substance, pellucid, and tessellated. The leaves are about half an inch broad, and lie flat upon the ground, are smooth, and of a light green colour on the upper side, divided in the middle by a black line or nerve; which, on the under side, emits numerous downy radicles, by which the plant adheres closely to the ground. Each leaf is divided into two or three obtuse or round segments, a little sinuated and crisped on the edges. From the centre of the leaves, out of a red (purple) calyx, arises a short, cylindrical sheath, with a quadrifid rim, out of which grows a pellucid, tubular, silvery, tender peduncle, about 2 inches high, bearing at the top a globular capsule, of a blackish-green colour, which bursts into 4 roundish-oval, smooth segments, in the centre of which are black, elastic hairs, exploding a yellowish brown powder.”—Such is LIGHT-

FOOT's happy description, copied, as was his custom, in part from DILLENIIUS. It is to be regretted that the original descriptions of the former botanist are so few, for, in that department, he was only inferior to LINNÆUS, and has not, I think, been equalled by any of his successors.

24. *J. pinguis*, frond oblong, irregularly branched or nearly simple, nerveless, smooth, thickish, crisp, dark-green; fruit arising from the underside near the margin; calyx very short, the mouth dilated, fimbriated; calyptra exserted, oblong-cylindrical, smooth.—LIGHTF. *Scot.* 789; HOOK. *Scot.* ii. 118; DILL. *Musc.* t. 74. f. 42.

Hab. In bogs on moors, intermixed with mosses, frequent.

†† *Frond narrow.*

25. *J. multifida*, frond decumbent, pinnatifid, nerveless, plane, succulent; fruit marginal, calyx very short, the mouth dilated, fimbriate.—WITH. iii. 1063; HOOK. *Scot.* ii. 118; DILL. *Musc.* t. 74, f. 43.

Hab. Moist clay banks, on decayed stumps of trees, in patches of a dark green. Dodd's-well. New-water-haugh wood. Spring.

26. *J. furcata*, frond prostrate, linear, obtuse, dichotomous, membranous, ribbed, smooth above, more or less hairy beneath; fruit arising from the lower surface of the nerve; calyx 2-lobed, conduplicate, ciliated at the margin; calyptra obovate, hispid.—LIGHTF. *Scot.* 791; WITH. iii. 1062; HOOK. *Scot.* ii. 118; DILL. *Musc.* t. 74, f. 45.

Hab. Trunks of trees and rocks, and sometimes on stone walls in shaded places, in green matted patches. Spring.

Thin and reticulated; the margins entire, somewhat waved.

27. *J. pubescens*, frond prostrate, linear, obtuse, dichotomous, membranaceous, ribbed, pubescent in every part.—HOOK. *Scot.* ii. 119.

Hab. On shaded rocks, rare. In Dulaw Dean.

Very like the preceding, from which, however, it is distin-

guished, even at a distance, by the grey shade of its patches.

36. ANTHOCEROS.

1. *A. punctatus*, leaves frondose, appressed, crisped and crenate, forming circular patches; fruitstalks with a tubular entire sheath at the base, smooth, green, awlshaped.—WITH. iii. 1086; SPRENG. *Syst. Veg.* iv. 236; DILL. *Musc.* 476. t. 68. f. 1.

Hab. Corn fields with a peat soil, about Gavington, Berwickshire, Mr Thomas Brown. Autumn.

The leaves form depressed circles about the size of a shilling, and of a fine pellucid grass-green colour, adhering to the soil by radical fibres which pullulate from the whole lower surface. The frond is thickish, fleshy, and gummy when cut or torn. The fruitstalk, in our specimens, is about an inch in length, several arising from the same plant.—Sprengel says it is to be found “per omnem terrarum orbem;” a remark which may be true, but scarcely warranted by what was known at the period of the publication of his laborious and excellent work. It is now, for the first time, described as a native of Scotland, and the merit of its discovery is due to my young and zealous friend Mr THOMAS BROWN, son of the Rev. Dr BROWN of Langton.

37. MARCHANTIA.

1. *M. polymorpha*, “receptacle of the capsules deeply cut in a stellated manner into about 10 narrow segments, that of the anthers pedunculated.”—LIGHTF. *Scot.* 793; WITH. iii. 1081; HOOK. *Scot.* ii. 119; *Eng. Bot.* t. 210; DILL. *Musc.* t. 76, f. 6. and t. 77, f. 7.

Hab. On shady moist rocks, “where the sunbeams seldom come, and where no traveller frequenteth,” common; and sometimes in bogs.

Frond adherent, forked, plane, ribbed, coriaceous and opaque, margin entire, apex obtuse, under surface downy, upper surface of a grass-green colour, reticulated with minute rhomboidal or lozenge-like scales. SPRENGEL says of this singular moss also, that it is found “per omnem terrarum orbem.”

38. RICCIA.

1. *R. glauca*, frond depressed, linear, dichotomous, siskin-green, fleshy, obsolete furrowed in the middle.—LIGHTF. *Scot.* 779; WITH. iii. 1085; HOOK. *Scot.* ii. 110; PURT. *Mid. Fl.* ii. 573, t. 5; DILL. *Musc.* t. 78, f. 10.

Hab. Stubble fields, on a peat soil, in circular patches about the size of a sixpence, adhering by numerous fibres from the under surface. About Gavington, Mr Thomas Brown. Autumn.

ORDER VI.

LICHENES.

" But ere you enter, yon bold Tower survey,
 Tall and entire, and venerably grey,
 For Time has soften'd what was harsh when new,
 And now the stains are all of sober hue;
 The living stains, which Nature's hand alone,
 Profuse of life, pours forth upon the stone;
 For ever growing; where the common eye
 Can but the bare and rocky bed descry:
 There Science loves to trace her tribes minute,
 The juiceless foliage, and the tasteless fruit;
 There she perceives them round the surface creep,
 And while they meet, their due distinctions keep;
 Mix'd but not blended; each its name retains,
 And these are Nature's ever-during stains."

CRABBE.

OBS.—Lichens have no distinct roots, nor stem, nor leaves, properly so called; and the fructification proceeds immediately from the *frond*,—a term by which is designated the entire body of every individual plant. They grow on the ground, on rocks or on trees, in thin leprous or warted crusts, or in lobed, leaf-like, rosaceous patches, or in shrubby or coralloid tufts. They are perennial, coriaceous, rarely somewhat gelatinous, variously coloured, densely cellular, and, when dried, revive slowly on exposure to moisture. They vegetate chiefly in the winter months, and, drying up during summer, become less conspicuous and of little beauty. If a lichen be smartly stricken so as to rupture its cells, the white internal substance or parenchyma becomes green.

This phenomenon is peculiar to the family, and appears to be owing, according to the observations of RAMOND, to the extravasation of a peculiar juice contained in the little cells. The fructification consists of tubercles, or raised letter-like lines bursting through a crust, or of round saucer-shaped or shield-like disks, with or without an adventitious border, and in the substance of which disks the seeds are probably lodged. The fructification, whatever may be its form, is termed *Apothecia*.

LINNÆUS included the Lichens in a single genus; and the first attempt to introduce, to English botanists, a better arrangement, was made by the authors of the Botanist's Guide through the counties of Northumberland and Durham, published in 1807. They, however, gave definitions neither of the genera nor species of the Acharian method which they adopted,—a deficiency which, so far as the former were concerned, was well supplied in the article *Lichen*, written for Dr BREWSTER'S Edinburgh Encyclopædia by PATRICK NEILL, Esq.—an article of much interest, and of which I have freely availed myself. Since that time the arrangement of ACHARIUS has been followed by all British naturalists, with perhaps some injustice to authors of not less reputation than the Swede, who too little regarded the labours of some of his predecessors. WAHLENBERG complains of this openly (*Fl. Lap.* p. 400.), and HOFFMAN and DE CANDOLLE had not less reason of complaint. The French and Germans still, I believe, decline to adopt the method of ACHARIUS, but, in a local Flora of this kind, it would be injudicious to depart from established custom, although the names of others have the claim of priority, and although I feel persuaded that the genera might with propriety be reduced in their numbers.

- * *Apothecia saucer-shaped or peltate, with a raised border. (In age the disk sometimes becomes convex, so that the apotheciæ resemble a tubercle, but the border is permanent, and always distinguishable.)*

† *Frond foliaceous or crustaceous, appressed or adnate.*

- 39. PELTIDEA. *Frond foliaceous, spreading, lobed, with woolly veins beneath. Apothecia roundish, terminating the lobes, superior, the border thin, and formed from the frond.*

40. **NEPHROMA.** *Frond* foliaceous, spreading, lobed, naked or villous beneath. *Apothecia* roundish, terminating the lobes, inferior, surrounded by an elevated inflexed margin.
41. **STICTA.** *Frond* foliaceous, spreading, lobed, pubescent beneath, and marked with white round naked spots. *Apothecia* scattered, shield-like, fixed by a central point, the border formed from the frond.
42. **CETRARIA.** *Frond* foliaceous, ascending or spreading, lobed, naked on both sides. *Apothecia* obliquely adnate with the margin, shield-like, the border inflexed, derived from the frond.
43. **COLLEMA.** *Frond* foliaceous, lobed, depressed, subgelatinous, coriaceous when dry. *Apothecia* scattered, shield-like, formed from the substance of the frond.
44. **BORRERA.** *Frond* depressed, laciniate, the segments free, channelled beneath, and ciliate at the margin. *Apothecia* saucerlike, scattered, the border formed from the frond.
45. **PARMELIA.** *Frond* foliaceous, lobed, appressed, spreading circularly, fibrous beneath. *Apothecia* saucer-like, sessile, scattered, the border formed from the frond.
46. **LECANORA.** *Frond* crustaceous, spreading circularly, adnate, plane. *Apothecia* saucer-like, sessile, with a thickish border formed from the crust.
47. **LECIDEA.** *Frond* crustaceous, spreading, adnate and uniform. *Apothecia* saucer-like or tubercle-like, sessile, with a raised border of the same nature and colour as the disk.
- ++ *Frond* divided into branch-like segments, plane.
48. **EVERNIA.** *Frond* suberect or pendulous, with a central filament within. *Apothecia* shield-like, sessile, the disk concave, coloured, the border formed from the frond.
49. **RAMALINA.** *Frond* erect or pendulous, fibrous, and nearly solid within. *Apothecia* shield-like, subpedicellate, plane, wholly formed from the substance of the frond.

+++ *Shrubby, the branches cylindrical or filiform.*

50. **CORNICULARIA.** *Frond* erect, branched, fibrous, and nearly solid within. *Apothecia* terminal, obliquely peltate, at length convex, somewhat inflated, the border toothed.
51. **ALECTORIA.** *Frond* pendulous or prostrate, much branched, the branches filiform, fibrous and somewhat fistulose within. *Apothecia* shield-like, thick, sessile, wholly formed from the frond.
52. **USNEA.** *Frond* mostly pendulous, much branched, furnished within with a bundle of elastic fibres. *Apothecia* terminal, peltate, often ciliate at the border, wholly formed from the frond.
- * * *Apothecia coloured tubercles terminating the branches, or raised on a stalk.*
53. **CENOMYCE.** *Frond* either branched, shrubby, and fistular, or depressed, foliaceous, and lobed, with erect, somewhat hollow stalks, cupped at the top. *Apothecia*—coloured tubercles on the tips of the branches, or clustered on the margins of the cups.
54. **SPHÆROPHORON.** *Frond* shrubby, branched, solid. *Apothecia* covered with the substance of the frond, bursting irregularly, and containing a black pulverulent mass.
55. **BÆOMYCES.** *Frond* crustaceous, spreading, adnate. *Apothecia* solid tubercles terminating a short, solid, simple stalk.
56. **ISIDIUM.** *Frond* crustaceous, plane, spreading, adnate. *Apothecia* on very short solid stalks, the disk somewhat immersed, having a border formed from the substance of the stalk.
- * * * *Apothecia in the form of waved or flexuose lines.*
57. **GYPHOPHORA.** *Frond* foliaceous, peltate, mostly monophyllous, free beneath. *Apothecia* subscuteliform, sessile or adnate, covered with a black cartilaginous membrane, the disk warty, or plaited in circles, and bordered.

58. *OPEGRAPHA*. Frond crustaceous, thin, adnate. *Apothecia* linear, black, sessile or somewhat immersed, having a longitudinal and mesial cleft.
59. *ARTHONIA*. Frond crustaceous, thin, adnate. *Apothecia* sessile or somewhat immersed, of an irregular roundish figure, without a border.
- ***** *Apothecia tubercular or granular, sessile, sometimes perforated on the apex.*
60. *SPILOMA*. Frond crustaceous, thin, adnate, uniform. *Apothecia* composed of minute bodies collected into a compact granular coloured mass.
61. *VARIOLARIA*. Frond crustaceous, plane, spreading, adnate, uniform. *Apothecia* wart-like, formed from the crust, granular, submarginate, white, including a naked nucleus.
62. *VERRUCARIA*. Frond crustaceous, thin, adnate. *Apothecia* hemispherical, somewhat immersed, furnished with a minute prominent orifice.
63. *PORINA*. Frond crustaceous, tuberculated, adnate. *Apothecia* imbedded in the tubercles, and opening by an obvious pore.
64. *ENDOCARPON*. Frond crustaceous, adnate, of some determinate form; or foliaceous and peltate. *Apothecia* globose, concealed in the substance of the plant, surrounded by a thin membrane, furnished with a slightly prominent orifice, and containing a nucleus.
- ***** *Lichens destitute of Apothecia, and whose fructification is unknown.*
65. *LEPRARIA*. Frond a pulverulent and fibrous crust, spreading, adnate, uniform.

39. PELTIDEA.

1. *P. canine*, frond broad, irregularly lobed, bluish-grey, wrinkled, beneath white, with prominent woolly veins, fibrous; apothecia

roundish, deep orange-brown with a buff border, ascending, and often revolute. HOOK. Scot. ii. 60. *Lichen caninus*, WITH. iv.

74. LIGHTF. Scot. 845. Eng. Bot. t. 2299. *Peltigera canina*, SPRENG. Syst. Veg. iv. 305. DILL. Musc. t. 27. f. 102.

Hab. On grassy banks, heaths, and about the roots of old trees, common.

The frond is a large leather-like irregularly lobed leaf, wrinkled, and generally furfuraceous on the upper surface, loosely adherent to the ground by the long subulate processes which proceed from the veins beneath. The shields are large, plane or revolute, "shaped like the human nail." The powder of the dried plant was celebrated by Dr MEAD as a certain cure for canine madness. The history and receipt may be seen at length in the work of DILLENII.

2. *P. rufescens*, frond even, reddish-brown, irregularly lobed, beneath fawn-coloured, downy, scarcely reticulate; lobes rounded, with reverted edges; apothecia deep reddish-brown, plane, thin, revolute, with a buff entire border. WINCH Guide, ii. 61. *P. canina*, var. *rufescens*, HOOK. Scot. ii. 60. *Lichen rufescens*, WITH. iv. 76. Eng. Bot. t. 2300.

Hab. On earth-capt dikes, banks, &c., not uncommon.

The under surface of this species is almost equally covered with a buff-coloured short down, without any subulate processes. The shields are on short lobes, and numerous.

3. *P. spuria*, glaucous-green, smooth, beneath white, with brownish inosculating veins; apothecia on narrow elongate lobes, revolute, umber-brown. Loud. Encyclop. No. 15611. MOUG. and NEST. 837. DILL. Musc. t. 28. f. 108.

Hab. On heathy ground, not common. Sea banks near Berwick.

Our specimens agree precisely with those in the work of MOUGEOT and NESTLER, and with specimens from ACHARIUS, in the herbarium of Mr WINCH. It is a small species, pushing forth numerous narrow oblong lobes, each terminated with the involute shield. The under surface is scarcely pubescent, white, reticulated with slightly raised brownish veins. This and the preceding are probably merely different states of the first species.

40. NEPHROMA.

1. *N. resupinata*, "coriaceous, creeping, lobed, brown; shields marginal, on the under side of the frond." Hook. Scot. ii. 61. *Lichen resupinatus*, LIGHTF. Scot. 813. WITH. iv. 77. Eng. Bot. t. 305. *Peltigera resupinata*, SPRENG. Syst. Veg. iv. 305. DILL. Musc. t. 28. f. 105.

Hab. On trees in woods. Penmanshiel-wood. Wood above the Retreat, in which it may also be found on loose stones.

The lobes are imbricated, rounded, depressed, smooth; fawn-coloured, and uneven beneath. Shields subcircular, saucer-like, brownish-orange. The figure in Eng. Bot. is too green.

41. STICTA.

1. *S. scrobiculata*, suborbicular, leafy, deeply lobed; lobes rounded, crenate, pitted, greenish-grey, with mealy warts; beneath buff-orange, downy, spotted with white; "shields small, scattered, tawny." Hook. Scot. ii. 59. *Lichen scrobiculatus*, WITH. iv. 64. LIGHTF. Scot. 850. Eng. Bot. t. 497. DILL. Musc. t. 29. f. 114.

Hab. On mossy rocks in moors, not uncommon, and in woods on trees. Rawse Castle, N. Penmanshiel-wood. Wooded banks of the Dye above Longformacus, &c.

Is. RAUD is commemorated by DILLENIIUS as having first found this fine lichen in England. It is a subcircular deeply lobed coriaceous leaf, often as large as a man's hand, fixed near the centre, but free and somewhat raised at the edges. When moist, as WAHLENBERG remarks, it is of a remarkable leaden colour, but becomes paler when dried. The upper surface is studded more or less with farinaceous tubercles, which often run into waved or circular lines; and the under one is curiously spotted with bare white elevations. The shields are very rarely found.

2. *S. pulmonaria*, broad, irregularly and deeply lobed, greenish-grey, deeply pitted, reticulated, more or less roughened with farinaceous lines, beneath pubescent, tawny, spotted. Hook. Scot.

ii. 58. *Lichen pulmonarius*, LIGHTF. Scot. 831. WITH. iv. 59. DILL. Musc. t. 29. f. 113.

Hab. On the trunks of moss-grown trees. On the ash, at Longformacus, with the preceding.

Has no tendency to grow, like the *scrobiculata*, in a circular manner, and readily distinguished from it by the remarkable character of the upper surface,—reticulated with large inosculating wrinkles, which form the boundaries of deep intermediate pits. The ancients used it to cure coughs, asthmas, and other disorders of the lungs, probably from some fancied resemblance between it and the marbled colour of those organs.

42. CETRARIA.

1. *C. islandica*, upper surface chestnut-brown, paler beneath. HOOK. Scot. ii. 58. *Lichen islandicus*, LIN. Fl. Lap. 354. LIGHTF. Scot. 829. WITH. iv. 58. Eng. Bot. t. 1330. *Parmelia islandica*, SPRENG. Syst. Veg. iv. 280. DILL. Musc. t. 28. f. 111.

Hab. Upland moors. Lamberton moor, plentiful.

Frond 2–3 inches high, suberect, plane, irregularly branched and lobed, smooth, and somewhat glossy, pitted, chestnut or yellowish-brown, paler beneath; margin ciliate, with short spinous processes. The little circular pits are coated, more or less, with a white granular powder.

A decoction of this lichen has been much recommended in pectoral and consumptive complaints; and in the northern parts of Europe, it is extensively used as an article of diet. In Iceland, immense quantities are annually gathered, partly for exportation to this and other countries, and partly for home consumption. The natives extract the bitter and purging principles of the lichen by steeping it in water; then they dry and reduce it to powder, which they eat made into cakes, or boiled with milk. HENDERSON, in his Tour through Iceland, tells us, that a porridge made of it, is, to a foreigner, not only the most wholesome, but the most palatable of all the articles of Icelandic diet. The Saxon Government have published a report, in which they recommend it to be used in making bread in those districts where flour is scarce. “In this report, we are informed, that 6 pounds and 22 loths of lichen meal boiled with fourteen times its quantity of water, and baked in this state with 59½ lb. of flour, produced 111½ lb. of good household

bread. Without this addition, the flour would not have produced more than $78\frac{3}{4}$ lb. of bread; consequently, this addition of 6 lb. and 22 loths of lichen meal has occasioned an increase of $32\frac{3}{4}$ of good bread. It is known, that 3 lb. of flour yield 4 lb. of household bread. One lb. of lichen meal, added in the form of paste, gives an addition of nearly 6 lb., and therefore is equivalent in this view to about $3\frac{3}{4}$ lb. of flour, because it affords above $3\frac{1}{2}$ times more bread than this. But at present nearly all the Iceland moss collected in Germany is sent through Hamburgh to England, where it is used in brewing, and in the composition of ship-biscuit, as it is said biscuit which contains it as a constituent part is not attacked by worms, and suffers little from the action of sea-water. This lichen, when deprived of its bitter principle, forms an excellent soup, and when coagulated, a good jelly; and it has been recommended in this prepared state as an excellent substitute for sago, salop, and even for chocolate."—*Edin. Phil. Journ.* iii. 414. See also Mr NEILL's paper on Lichens, p. 737, for some interesting particulars.

2. *C. glauca*, depressed, membranous, thin, irregularly lobed, greyish-white, beneath black and glossy. HOOK. *Scot.* ii. 57. *Lichen glaucus*, LIGHTF. *Scot.* 838. WITH. iv. 57. *Eng. Bot.* t. 1606. *Parmelia glauca*, SPRENG. *Syst. Veg.* iv. 283.

Hab. On stones in moors and on heather. Lamberton moor.

The fronds form loose straggling tufts, are thin and membranous, irregularly lobed, the lobes ascending, lacinate and curled, greyish-white, smooth, and somewhat glossy above, but beneath very glossy black, wrinkled, the ends of the lobes chestnut-brown.

43. COLLEMA.

1. *C. crispum*, blackish-green, circular, the disk granular or warty, lobes of the circumference rounded, radiating, foliaceous, cut and irregularly raised. GREV. *Fl. Edin.* 350.

Hab. On rocks at Hudshead, at a part where the water trickles down in wet weather.

"The different size of the central and external lobes is the most obvious character."—GREVILLE. The diameter of

each patch is about an inch, but two or three often grow in contact. Our specimens have no apothecia.

2. *C. melænum*, "orbicular, substellate, imbricated; lobes torn and laciniate, with raised, waved, crisped and crenulate margins; fructification marginal, plane, similar in colour to the frond, with the border granulated." HOOK. *Scot.* ii. 71. GREV. *Fl. Edin.* 350. *Lichen marginalis*, *Eng. Bot.* t. 1924.

Hab. On shaded walls near Berwick, growing with mosses, plentiful.

Grows in subcircular thick patches of a blackish-green colour, very conspicuous and somewhat gelatinous in moist weather. The apothecia are rather large, and, in all the specimens we have seen, of a brown colour.

3. *C. nigrum*, "frond crustaceous, roundish, brown-black, lobes of the circumference cut and crenate, the central granular; apothecia becoming convex, black-edged."—Loud. *Encyclop.* No. 15668.

Hab. On the ground in firm gravelly places, and on shaded walls with the preceding. Sandstone quarry at Hudshead. Footpath near the Old-Castle.

Our specimen precisely resembles that of *C. nigrum* preserved in MOUGEOT and NESTLER's collection. The patches which it forms are thinner than those of the preceding; and the apothecia are much smaller and much more numerous, convex, and of a dull brown colour.

44. BORRERA.

1. *B. furfuracea*, upper surface ash-grey, farinaceous; the under very black. HOOK. *Scot.* ii. 56. *Lichen furfuraceus*, LIGHTF. *Scot.* 832. WITH. iv. 60. *Eng. Bot.* t. 984. *Parmelia furfuracea*, SPRENG. *Syst. Veg.* iv. 281. DILL. *Musc.* t. 21. f. 52.

Hab. On the wall of Chillingham Park at Rawse Castle, plentiful.

The fronds grow loosely, spreading or decumbent,[†] in large roundish tufts, and are much branched; the branches linear, dichotomous, convex above, and of a nearly ash-grey colour, beneath channelled, wrinkled and black, the apices being reddish-orange; the apothecia were not observed.

2. *B. ciliaris*, upper surface greenish-glaucous-grey; the under snow-white. HOOK. *Scot.* ii. 56. *Lichen ciliaris*, LIGHTF. *Scot.* 328. WITH. iv. 60. *Eng. Bot.* t. 1352. DILL. *Musc.* t. 20. f. 45.

Hab. On rocks slightly covered with earth, and trunks of trees. Lamberton-Moor.

Frond somewhat depressed, dirty brown when dry, roughish, branched, segments linear, pinnatifid, ciliate at the margins, beneath channelled, wrinkled and white.

3. *B. tenella*, greyish-white on both sides, somewhat furfuraceous. HOOK. *Scot.* ii. 56. *Lichen tenellus*, WITH. iv. 61. *Eng. Bot.* t. 1351. *L. ciliaris* β , LIGHTF. *Scot.* 328. DILL. *Musc.* t. 20. f. 46.

Hab. On trees, shrubs, and stone-walls, very common.

Frond depressed, circular, substellate, greyish-white; segments pinnatifid, narrow, ascending, ciliate, slightly dilated and vaulted at the ends, or tubular. Apothecia scattered, generally towards the centre, black, often covered with a grey bloom, cupped, becoming plane or slightly convex, the border white. SPRENGEL considers this a variety of *Parmelia stellaris*, an opinion which, whether correct or not, shows how very closely the genera *Borreria* and *Parmelia* are related. Their distinctive characters, indeed, appear so trivial, that many authors discard the former genus, a circumstance which, in one view, and in one only, is to be regretted, since the name was intended to commemorate a very eminent botanist of our own country,—a tribute of respect from a foreigner to native worth and talent.

45. PARMELIA.

* *Under surface paler coloured than the upper.*

1. *P. olivacea*, closely appressed, greenish-brown, shining; lobes plane, irregularly cut, rounded, tawny beneath; “shields dark-chestnut-olive, with an inflexed unequal margin.” HOOK. *Scot.* ii. 52. *Lichen olivaceus*, LIGHTF. *Scot.* 819. WITH. iv. 37. *Eng. Bot.* t. 2180. DILL. *Musc.* t. 24, f. 77, 78.

Hab. On the smooth bark of trees, common, but without fructification.

Grows in circular closely adherent patches; the lobes plane, broad, rather glossy, smooth, or much granulated and rugged in the central parts; under surface blackish-brown, tawny at the edges; tear white. A variety is occasionally found in shaded woods of a pistachio-green colour.

2. *P. parietina*, imbricated, saffron-yellow; the lobes crisped, obtuse, paler beneath; shields reddish-orange. Hook. Scot. ii. 52. *Lichen parietinus*, LIGHTF. Scot. 822. WITH. iv. 36. Eng. Bot. t. 194. DILL. Musc. t. 24, f. 76.

Hab. On stone walls, on trees, and in hedges, where

“The yellow moss in scaly rings
Creeps round the hawthorn’s prickly bough.”

Very common and very conspicuous from its bright colour. On walls the patches are always circular, but small branches it encrusts in an irregular manner; and if in the shade, the frond acquires a tinge of green, when it becomes the *Lichen juniperinus* of LIGHTFOOT. The shields are cupped or saucer-like. “It is affirmed,” says LIGHTFOOT, “to dye a good yellow or orange-colour, if fixed with alum.” Children, in our younger days, used to dye their eggs of a yellow colour with it at the time of Easter.

3. *P. aquila*, imbricated, somewhat cartilaginous, greenish-brown; segments narrow, many-cleft, convex, those of the circumference appressed, paler beneath; shields blackish brown. Hook. Scot. ii. 54. *Lichen pullus*, LIGHTF. Scot. 825. *L. obscurus*, WITH. iv. 30. *L. aquilus*, Eng. Bot. t. 982. DILL. Musc. t. 24, f. 69.

Hab. On rocks at the sea-side, plentiful on many parts of the Berwickshire coast. Hudshead, and on the Fern Islands, N. Durham.

Grows in rather thick circular patches, adherent everywhere to the rock, of a dull brownish-green colour when recent and moist, but tawny-brown when dry. The segments are narrow, paler beneath, with black fibres; those of the circumference radiating and closely appressed. The shields are in general very numerous, placed in and towards the centre, saucer-like with a thickened border. In old age the central portion frequently disappears. The figure in Eng. Botany must have been coloured from a dry cabinet specimen.

4. *P. stellaris*, stellated, ash-grey, beneath whitish with black fibres; segments linear, smooth, rather convex, multifid; shields hoary, black, with a grey inflexed border. *Hook. Scot.* ii. 55. *Lichen stellaris*, *LIGHTF. Scot.* 824. *WITH.* iv. 32. *Eng. Bot.* t. 1697. *DILL. Musc.* t. 24. f. 70.

Hab. On the trunks of trees, not uncommon.

“It forms roundish patches conspicuous for their neat radiating figure, and their bright silver-grey hue, which is nearly the same whether wet or dry, and never assumes any tinge of green.” The figure in *Eng. Bot.* is very faulty in respect of colouring: and that of *DILLENII* is scarcely worth quoting.

* * *Under surface darker coloured than the upper.*

5. *P. pulverulenta*, imbricated, stellated, deep glaucous green, ash-grey when dry; segments lobed, plane, obtuse, beneath black and fibrilose; shields black, hoary, with a thick inflexed border. *Hook. Scot.* ii. 55. *L. stellaris* β. *LIGHTF. Scot.* 824. *Lichen pulverulentus*, *Eng. Bot.* t. 2063.

Hab. On the trunks of old ash-trees in large circular patches, often becoming irregular.

The frond is more or less uneven. The shields are numerous and pressed against one another, at first hoary, but this disappears, and they are then brownish-black. The border is thick, and “as it advances in age, acquires a scaly, and often leafy, circumference.”

6. *P. saxatilis*, imbricated, bluish-grey; segments irregularly cut and crenate, pitted, rough, beneath black, hirsute; shields deep reddish-brown with a granular border. *Hook. Scot.* ii. 53. *Lichen saxatilis*, *LIGHTF. Scot.* 816. *WITH.* iv. 36. *Eng. Bot.* t. 603. *DILL. Musc.* t. 24. f. 83.

Hab. On trunks of ash-trees, and on large stones and rocks, common.

The fronds spread circularly in a rugged imbricated manner. Those on trees are of a bluer colour than those on stones. The former we have not observed in fruit, the latter frequently, but they are then generally rough all over with small farinaceous tubercles. The shields are large, cupped

at first, becoming nearly plane, with a flexuose granular border. The inferior edges of the segments are brown.

7. *P. conspersa*, imbricated, mountain-green; segments of the circumference radiating, cut and crenate, the centre roughened; under surface black; apothecia chestnut-brown, with an even border. HOOK. *Scot.* ii. 55. *Lichen centrifugus*, LIGHTF. *Scot.* 814. WITH. iv. 35. DILL. *Musc.* t. 24. f. 75.

Hab. Rocks, not common in Berwickshire. On rocks by the side of the Whiteadder about the Retreat, abundant.

DILLENIIUS, who gathered his specimens in Wales, was the first to describe this lichen as a British species, in his great work—the *Historia Muscorum*. The frond forms circular patches of a considerable size, and of a pleasant colour, variously described as whitish-green, or greenish or greyish-yellow, but which approaches nearest to what Mr SYME calls mountain-green. The outer segments are closely appressed and radiating, but the centre of the circle often consists only of minute furfuraceous leaves, which decay first and are worn away, leaving those of the circumference in the form of a broad circular band. The apothecia are numerous, crowded towards the middle, saucer-like, rather large, the margin of the same colour as the frond, thinnish, and generally waved.

8. *P. omphalodes*, imbricated, purplish-brown, glazed, with white zigzag cracks; segments many-lobed, lobes plane, truncate, entire; beneath black, hirsute; shields dark chestnut. HOOK. *Scot.* ii. 53. *Lichen omphalodes*, LIGHTF. *Scot.* 818. WITH. iv. 36. WALKER'S *Essays*, 191. *Eng. Bot.* t. 604. DILL. *Musc.* t. 24. f. 80.

Hab. On stones on our higher moors.

We are told by some of the older botanists, that the poor in the counties of Derby and Lancaster, and in Wales, were wont to dye their woollen clothes of a dull brown colour with this lichen, but the colour was not durable. The Highlanders, and the people of the Western Islands of Scotland, to whom it is known by the name of Crostil or Crotal, used it much for the same purpose; but they appear to have obtained a better colour by steeping the lichen in urine till it became soft and like a paste, which they formed into cakes, dried them in the sun, and preserved for use. The country people in Ireland adopted a similar custom, which, like all other customs of the kind, has probably now

become obsolete. To the volatile alkali *P. omphalodes* immediately imparts a tawny-red, and this infusion affords one of the most indestructible of all colours. "The colour remains after the substance that extracted it is gone; it is not in the least impaired by long exposure to the air; nor can it be either destroyed or changed by acids, alkalies, or alcohol. A most singular property! as there is no red dye in use that remains unaltered by these powerful liquors."—Dr WALKER. PENNANT tells us, that in 1772 it was an article of commerce from the west of Scotland, exported for the use of the dyers, at the price of a shilling or sixteen pence a stone.

9. *P. physodes*, imbricated, greyish-white, smooth, beneath glossy black, naked; ends of the lobes inflated, brown below. HOOK. Scot. ii. 56. *Lichen physodes*, WITH. iv. 34. Eng. Bot. t. 126. DILL. Musc. t. 20. f. 49.

Hab. On the stems of heath in moors, and on trunks of trees. Lamberton moor. Blackadder plantations, abundant.

"This species is remarkable for being always composed of two membranes, the undermost black, the upper white, with a considerable cavity between them." I have not observed it in fruit. According to Dr WESTRING this lichen is very rich in colouring matter, affording, by means of different re-agents, tints varying from a citron-yellow to chestnut-brown. NEILL.

46. LECANORA.

1. *L. atra*, crust coarsely granulated, thickish, greyish-white; apothecia very black, cupped, with a white elevated border. HOOK. Scot. ii. 47. *Lichen ater*, LIGHTF. Scot. 813. WITH. iv. 19. Eng. Bot. t. 949. *Parmelia atra*, SPRENG. Syst. Veg. iv. 295. DILL. Musc. t. 18. f. 15.

Hab. On rocks and trunks of ash-trees, very common, in round or oval spots.

The apothecia are numerous, and frequently so crowded as to press on one another. In age they become plane.

2. *L. subfusca*, crust granular, greyish-white, rather thin; apothecia brown with a whitish border, cupped, becoming plane or con-

vex. HOOK. Scot. ii. 47. *Lichen subfuscus*, LIGHTF. Scot. 813.
 WITH. iv. 22. Eng. Bot. t. 2109. DILL. Musc. t. 18. f. 16.

Hab. On trees, gate posts, and on rocks, very common.

A species subject to much variety in the size of its apothecia, and in their shade of brown. It grows in oval or undefined patches, closely adherent, and thickly studded over with the fructification.

3. *L. ventosa*, crust granulated, warty, thick, yellowish-grey; apothecia deep reddish-brown or brownish-red, plane becoming convex, with a waved entire border.—HOOK. Scot. ii. 48. *Lichen ventosus*, LIGHTF. Scot. 806. WITH. iv. 16. Eng. Bot. t. 906. *Patellaria ventosa*, SPRENG. Syst. Veg. iv. 266.

Hab. Rocks on mountains. Cockburn Law.

The apothecia are but slightly elevated above the crust, or even with it. They eventually rise above and conceal the narrow border.

4. *L. perellus*, crust granulated, rather thick, white; apothecia of the same colour, wart-like, concave, with a thick rounded border.—HOOK. Scot. ii. 48. *Lichen parellus*, LIGHTF. Scot. 814. WITH. iv. 17. Eng. Bot. t. 727.

Hab. On rocks by the sea side, on stone walls, and on ash trees, common.

So abundant in this neighbourhood, that many of our stone dikes are whitened with its circular crusts. On the sandstone rocks at Hudshead it is remarkably fine, the circles there attaining such a size as to measure a foot in diameter. Crust adherent, coarsely granular, thickly studded with wart-like apothecia of the same colour as the crust, often granular in the disk, and surrounded with a thick raised border. When an apothecia is cut the centre appears of a flesh colour. The margin of the frond often assumes a brick-red colour. From this species the finest *litmus* is prepared; slips of unsized paper stained with which, are well known to chemists as delicate tests for ascertaining the presence of minute portions of uncombined acids.—NEILL.

5. *L. tartarea*, crust greyish-white, thick, coarsely granular, uneven, cracked; apothecia saucer-like, becoming large and irre-

gular, buff-orange, with a thickened inflected flexuose border.—
 Hook. Scot. ii. 49. *Lichen tartareus*, LIGHTF. Scot. 811. WITH.
 iv. 25. Eng. Bot. t. 156. DILL. Musc. t. xviii. f. 13.

Hab. On rocks, not uncommon.

DILLENIUS tells us that the Welsh use this lichen to dye wool and other articles a brownish-red or claret colour. It is likewise employed for the same purpose by the Scottish Highlanders, who call it *Corcur*. At Glasgow, where it is extensively employed by the manufacturer, it is called *Cudbear*,—a denomination which it has acquired from a corrupt pronounciation of the Christian name of the chemist (Dr CUTHBERT GORDON) who first employed it on a great scale. The greater part is imported from Norway, but in the Highland districts many an industrious peasant gets a living by scraping this lichen with an iron hoop, and sending it to the Glasgow market. When I was, says Dr HOOKER, in the neighbourhood of Fort-Augustus in 1807, a person could earn 14s. per week at this work, selling the material at 3s. 4d. the stone of 22 lb. The fructified specimens are reckoned the best.

6. *L. citrina*, crust undefined, thin, cracked when dry, even, pulverulent, sulphur-yellow; apothecia semi-immersed, brownish or orange-yellow, plane, small, scattered or crowded —*Ach. Syn.* 176. MOUG. and NEST., No. 742.

Hab. On stone walls, near their base, common.

The plant above described agrees precisely with the exemplars in MOUGEOT and NESTLER's work; and it is too common to admit the supposition that it can have been overlooked by the botanists of this country. I am therefore inclined to quote, as synonyms, *Lec. vitellina*, Hook. Scot. ii. 49. *Lichen vitellinus*, Eng. Bot. t. 1792. *L. flavicans*, WITH. iv. 27.

7. *L. murorum*, frond adnate, leafy and radiating at the circumference, orange-yellow, pulverulent; apothecia nearly of the colour of the frond, becoming plane and convex.—Hook. Scot. ii. 50. *Lichen candelarius*, β . LIGHTF. Scot. 811. *L. candelarius*, WITH. iv. 29.

Hab. On rocks and walls, in circular, generally small patches, frequent.

Distinguished by the bright colour and neatness of its circular frond. The apothecia are numerous, small, at first cupped, but in age assuming the form of tubercles. Their disk is brown, of a tint, however, too light to affect the uniformity of the colour to the eye.

According to Mr GRIFFITH, "whose extensive knowledge of this genus (*Lichen*), aided by long continued observation, stamps a high authority upon his opinions," this is merely a different state or variety of the preceding; an opinion to which my own observations would incline me to assent. Mr GRIFFITH informed Dr WITHERING that he had long observed that the lichens with farinaceous crusts become foliaceous, and that probably the *L. muro-rum*, *concolor*, *vitellina*, and *Parmelia parietina*, are probably the same plant under different circumstances. These remarks tend to prove the spurious nature of some of the Acharian genera, but wanting the pomp of circumstantial detail, they have been neglected or considered erroneous. The investigations of MEYER, however, lead to the same conclusions, which may now, perhaps, be considered as established; not because the latter "have not been contradicted," but because they are in accordance with the previous observations of a native botanist, not less accurate and trust-worthy than the foreigner.

47. LECIDEA.

* *Apothecia black.*

1. *L. confluens*, crust greyish-white, tessellated, spreading; apothecia scattered, black, becoming convex and like tubercles; internally black, with a thin greyish layer beneath the disk.—Hook. Scot. ii. 37. *Lichen confluens*, Eng. Bot. t. 1994. WITH. iv. 8.

Hab. On rocks and stones, common in this neighbourhood, principally on sandstone. Hudshead. Lamberton Moor.

At first the apothecia are nearly even with the crust, but latterly they rise like tubercles upon it. When on hard stone the crust is bordered with a black line, and the stone thus appears mapped over, but this border appears only when two distinct patches come in contact.

2. *L. sanguinaria*, crust greyish-white, coarsely granular; apo-

thecia black, convex and tubercle-like, with a bright scarlet layer internally.—HOOK. *Scot.* ii. 37. WINCH, *Guide*, ii. 32.

Hab. On rocks, rare. Murton Craigs, plentiful.

So like *Lec. confluens*, as only to be distinguished by the bright red colour of the interior of the apothecia,—a remarkable character, yet relative to the validity of which there is some doubt, for Mr HARRIMAN seems to have entertained the opinion that it was the result of some disease or chemical change.

3. *L. petræa*, crust thin, white, cracked, subpulverulent; apothecia black, prominent and tubercle-like, arranged irregularly in concentric circles.—GREV. *Fl. Edin.* 324. *Lichen concentricus*, Eng. Bot. t. 246.

Hab. On rocks, in circular patches, often of considerable size, not uncommon in Berwickshire.

Best distinguished from the preceding and following species by the circular arrangement of the fructification, which is very striking at a little distance; yet the name which expresses this remarkable character has been allowed to be superseded by a most unmeaning one.

4. *L. parasema*, greenish-grey, granular; apothecia black, scattered, without gloss.—HOOK. *Scot.* ii. 37. GREV. *Fl. Edin.* 325. t. 3. f. 1. *Lichen parasemus*, Eng. Bot. t. 1450. *L. sanguinarius*, LIGHTF. *Scot.* 803. DILL. *Musc.* t. 18. f. 3.

Hab. On trees, particularly on the ash, and on rocks, very common.

The descriptions of DILLENIIUS and LIGHTFOOT agree exactly with our plant, which is undoubtedly the *Lecidea elæochroma* of ACHARIUS, *Syn. Lich.* p. 18., and of MOUGEOT and NESTLER's *Stirpes Cryptogamicæ*, No. 746.; but I retain the name adopted by British botanists, for the *L. parasema* and *elæochroma* of ACHARIUS appear to be merely different states of one species. Crust thin, adherent, granular, somewhat cracked, greenish-grey. Apothecia tubercle-like, margined, numerous. Grows in circular or oval patches when unconstrained, but commonly rendered more or less irregular by coming in contact with other lichens, or other fronds of the same species. When growing separate, the border is paler than the rest of the crust; and it is curious to observe, that, whenever it comes in

contact with others, a black thread-like line marks the bounds of each individual frond with great precision and distinctness. Intermixed with *Lec. luteola* and *Lecanora subfusca*, it will often run over, in a map-like manner, a large portion of the trunk of the ash; and every individual plant, of whatever size, is bounded by this by no means ideal line.

5. *L. sulphurea*, crust asparagus-green, thick, uneven, rather smooth, cracked when dry; apothecia immersed, scarcely margined, blackish, mealy, small.—Hook. Scot. ii. 38. *Lichen sulphureus*, WITH. iv. 12. Eng. Bot. t. 1186.

Hab. On sandstone rocks at Hudshead, and on stone walls, in subcircular patches, not uncommon.

6. *L. Æderi*, crust very thin, brownish-orange, even, cracked; apothecia immersed, dull black, cupped, with a thick tumid border.—Hook. Scot. ii. 38. *Lichen Æderi*, WITH. iv. 11.

Hab. On loose stones of greywacke, in the west of Berwickshire.

7. *L. atro-alba*, crust very thin, spreading, black, cracked, with greyish-white areolæ; apothecia small, immersed, black, bordered, convex in the centre.—Hook. Scot. ii. 36. *Lichen atro-albus*, WITH. iv. 5.

Hab. On greywacke, with the preceding.

8. *L. atro-virens*, crust very thin, spreading, sulphur-yellow, cracked, areolar; apothecia black, even with the crust, or slightly concave, numerous, roundish or confluent.—Hook. Scot. ii. 37. *Lichen geographicus*, LIGHTF. Scot. 801. WITH. iv. 12. Eng. Bot. t. 245. DILL. Musc. t. 18. f. 5.

Hab. On rocks of greywacke, common.

The crust of this pretty species spreads wide, and is divided by black lines into unequal compartments, so as very exactly to resemble a painted map, to which it has been often compared. The old specific name ought to be restored.

9. *L. conspurcata*, crust spreading, greyish-white, cracked into small irregular squares by black anastomosing lines; apothecia

minute, immersed, black, obscurely bordered, centre depressed.—
Loud. Encyclop. No. 15406. *Lichen conspurcatus*, *Eng. Bot.* t. 964.

Hab. On sandstone rocks at Hudshead.

* * *Apothecia variously coloured.*

10. *L. luteola*, crust greyish-white, granular; apothecia yellowish-brown, tubercle-like.—*Hook. Scot.* ii. 39. *Lichen vernalis*, *LIGHTF. Scot.* 805. *WITH.* iv. 15. *Eng. Bot.* t. 845. *Patellaria vernalis*, *SPRENG. Syst. Veg.* iv. 265. *DILL. Musc.* t. 18. f. 4.

Hab. Trunks of trees, very common.

Grows in round or irregular thin patches, and almost always intermixed with the *L. parasema*. The apothecia are numerous; the smaller have a margin of the same colour as the crust, and others are covered with a greyish bloom, but both disappear in their progress to maturity.

11. *L. cæcio-rufa*, "crust cracked and areolated, rugose, darkish-grey; fructification plane, brownish-red, with sometimes a crenulate border, becoming at length convex, less bordered, dark or blackish-red."—*GREV. Fl. Edin.* 327. *Hook. Scot.* ii. 39. *Lichen aurantiacus*, *LIGHTF. Scot.* 810. *L. crenularius*, *WITH.* iv. 23. *L. ferrugineus*, *Eng. Bot.* t. 1650.

Hab. Sandstone rocks on the coast of North Durham and Berwickshire.

12. *L. anthracina*, crust spreading, cracked, roughish, darkish-brown: apothecia cupped, buff-coloured, with a very white mealy thick elevated border.—*Hook. Scot.* ii. 39. *Lichen byssinus*, *WITH.* iv. 26. *Eng. Bot.* t. 432.

Hab. On rocks at Hudshead, sparingly.

The crust, in our specimens, is of a dull black colour, cracked in squares, and nearly even.

48. EVERNIA.

1. *E. prunastri*, frond plane, branched in a dichotomous manner, upper surface greenish-white, pitted, smooth or marked with farinaceous tubercles, most numerous on the edges; beneath white, channelled, naked and wrinkled.—*Hook. Scot.* ii. 61.

Lichen prunastri, LIGHTF. Scot. 835. WITH. iv. 57. Eng. Bot. t. 859. *Parmelia prunastri*, SPRENG. Syst. Veg. iv. 280. DILL. Musc. t. 21. f. 55.

Hab. On trees, very common, in pendulous tufts, about 2 inches long, and very soft and pliable when moist.

Has a remarkable property of imbibing and retaining odours, and hence "it is fit to be used in compositions which serve for sweet perfumes, and that take away wearisomnesse, for which things that is best of all which is most sweet of smell."—"Of the very moss of the oak, that which is white (*E. prunastri*) composes the choicest cypress-powder, which is esteemed good for the head; but impostors familiarly vend other mosses under that name, as they do the fungi, (excellent in hæmorrhages and fluxes), for the true agaric, to the great scandal of physic."—EVELYN.

49. RAMALINA.

1. *R. fraxinea*, plane, wrinkled, irregularly branched and laciniate; apothecia scattered over the frond.—HOOK. Scot. ii. 68. *Lichen fraxineus*, LIGHTF. Scot. 835. WITH. iv. 61. Eng. Bot. t. 1781. *Parmelia fraxinea*, SPRENG. Syst. Veg. iv. 279. DILL. Musc. t. 22. f. 59.

Hab. On ash trees, frequent.

Frond pendulous, a span in length, broad, greyish-white. Apothecia buff-orange, numerous and scattered, unequal in size, the smaller cup-shaped, the large ones plane, with an undulate border, and generally placed on the edges of the frond.

2. *R. scopulorum*, compressed, elongate, much branched, branches dichotomous, fastigiate, linear; apothecia lateral, stalked.—HOOK. Scot. ii. 68. *Lichen scopulorum*, WITH. iv. 62. Eng. Bot. t. 688.

Var. Cæspitose, simple or sparingly branched, compressed, taper-pointed; apothecia lateral, stalked.—*Lichen siliquosus*, WITH. iv. 42. DILL. Musc. t. 17. f. 38. *good*.

Hab. On rocks on the sea coast. *Var.* 1. is abundant on the precipitous rocks below Marshall Meadows: *var.* 2. on Hudshead.

The first variety is pendulous, and grows to the length of 6

inches. It is very rigid when dry, and of a greyish-white or green colour. The branches are generally fastigate above, dichotomous, smooth, pitted, and glossy, or very rough with short processes and tubercles. The second variety grows in erect rigid tufts, rarely exceedingly 2 inches in height; the fronds either simple or once or twice branched, and roughened with tubercles, which appear to be imperfect or blighted apothecia. It seems to be the *Lichen calicaris* of LIGHTFOOT, 834,—when he tells us that “it will dye a red colour, and promises, in that intention, to rival the famous *L. roccella* or *argol*, which is brought from the Canary Islands, and sometimes sold at the price of L. 80 Sterling per ton. It was formerly used instead of starch to make hair powder.”

3. *R. fastigiata*, cæspitose, compressed, branched, branches smooth, pitted, thickened upwards and fastigate; apothecia terminal.—HOOK. *Scot.* ii. 68. *Lichen calicaris*, LIGHTF. *Scot.* 834. WITH. iv. 55. *L. fastigiatus*, Eng. *Bot.* t. 890. DILL. *Musc.* t. 23. f. 62.

Hab. On ash, thorn, and other trees, common.

LIGHTFOOT has mixed up the descriptions of this and the preceding under his *Lichen calicaris*.

4. *R. farinacea*, cæspitose, branched, branches compressed, linear, dichotomous, smooth, with farinaceous tubercles on the edges.—HOOK. *Scot.* ii. 68. *Lichen farinaceus*, LIGHTF. *Scot.* 833. WITH. iv. 54. Eng. *Bot.* t. 889. DILL. *Musc.* t. 23. f. 63.

Hab. On trees, very common; also on stone walls and rocks exposed to the sea, but in the latter stations smaller and more bushy.

This is very rarely to be found with apothecia, a state indeed in which I have not observed it, whereas the three preceding species are as rarely to be found without them. All the species are of the same uniform greyish-green or white colour; and all afford a mucilage or gum, which, in an economical and medical view, may probably be equal to that of *Cetraria islandica*.

50. CORNICULARIA.

1. *C. aculeata*, frond erect, shrubby, chestnut-brown, varnished; branches roundish, somewhat pitted, crowded, dichotomous, with

fasciculate spinous tips ; apothecia reddish-brown with a spinous border.—HOOK. *Scot.* ii. 69. *Lichen hispidus*, LIGHTF. *Scot.* 883. WITH. iv. 46. *Eng. Bot.* t. 452. DILL. *Musc.* t. 17. f. 31.

Hab. Elevated moors, common. Dirrington Law, in fruit.

The side next the ground is wood-brown, without any polish. The branches are short and intricate, spreading, sometimes naked, and sometimes very rough with short spinous processes.

2. *C. tristis*, frond deep pitchy brown, rounded or subcompressed, smoothish, distichously dichotomous, branches fastigiate, black above ; apothecia slightly convex, blackish-brown, somewhat margined, entire and toothed.—HOOK. *Scot.* ii. 69. *Lichen tristis*, WITH. iv. 45. *Eng. Bot.* t. 720. *L. corniculatus*, LIGHTF. *Scot.* 885. *Parmelia tristis*, SPRENG. *Syst. Veg.* iv. 276. DILL. *Musc.* t. 17 f. 37. *bona*.

Hab. On rocks near the summit of Hedge-hope, in dense rigid tufts from half an inch to 1 inch in height.

51. ALECTORIA.

1. *A jubata*, frond filiform, very much branched, decumbent or pendulous, blackish-grey, smooth and rather glossy ; branches slender, entangled, irregularly beset with mealy sessile tubercles.—HOOK. *Scot.* ii. 67. *Lichen jubatus*, LIGHTF. *Scot.* 891. WITH. iv. 49. *Eng. Bot.* t. 1830. DILL. *Musc.* t. 12. f. 7. and t. 13. f. 10.

Hab. On trunks of old trees, in pendulous tufts, sometimes 15 inches long, not uncommon ; and occasionally on large mossy stones in moors. On trees at Longformacus, Mr Thomas Brown. Rawse Castle, plentiful. Longridge Dean, and Murton Craigs. Dirrington Law.

The variety growing on rocks is the *Lichen chalybeiformis* of WITHERING and others. There is, under this species, in the inimitable *Flora Lapponica* of LINNÆUS, some interesting observations on Lapland and its natives, written in the terse and poetic style usual to that still unrivalled naturalist.

52. USNEA.

1. *U. hirta*, frond pendulous, rough with granular powder, greenish-grey, much and irregularly branched; branches intricate, flexuose, the ultimate ones setaceous.—*U. plicata*, var. *hirta*, Hook. Scot. ii. 70. *Lichen hirtus*, LIGHTF. Scot. 295. Eng. Bot. t. 1354. DILL. Musc. t. 13. f. 12.

Hab. On old trees, particularly on firs, common.

It is this *Usnea*, the *Evernia prunastri*, and the *Ramalina*, which clothe so profusely the trees of too thick or decaying plantations. A fir plantation, on moorish ground, is in particular generally much infested with them, and they give to the trees, by the hoary subdued colour of their motionless fronds, an appearance of old age they are far from having reached. They seem, as it were, to endeavour to hide the deformities which accompany decay, or to invest that decay with associations which are not displeasing. The fir, the birch, the ash, the oak, the sloe, and the hawthorn are, when old, always hung with this hoary livery; but the elm, the sycamore, the lime, and the beech wear it not, or very sparingly; so that, when GRAY speaks of “the rude and moss-grown beech,” he applies to it a character by no means appropriate, for no tree is so little or so seldom either rude or moss-grown. They who have wandered across moors, or in our retired deans, will often have noticed—’tis a common object—a thorn with few leaves and many a withered branch, old certainly, yet firm and unalterable for many a year, hung in profusion with these lichens. Such a thorn WORDSWORTH has described with his usual simplicity:

“Like rock or stone, it is o’ergrown
With lichens to the very top,
And hung with heavy tufts of moss,
A melancholy crop:
Up from the earth these mosses creep,
And this poor thorn they clasp it round
So close, you’d say that they were bent,
With plain and manifest intent,
To drag it to the ground.”

53. CENOMYCE.

* *Erect, branched, and fistular.*

1. *C. rangiferina*, greyish-white, roughish, erect, very much

branched, branches cylindrical, tubular, the ultimate ones sub-radiate or drooping.—HOOK. *Scot.* ii. 65. *Lichen rangiferinus*, LIN. *Fl. Lap.* 346. LIGHTF. *Scot.* 877. WITH. iv. 44. *Cladonia rangiferina*, SPRENG. *Syst. Veg.* iv. 270. DILL. *Musc.* t. 16. f. 29. and 30.

Hab. Moors, abundant.

Fronde from 1 to 3 inches high, hoary, or greyish-white, roughish, hollow, "much branched from bottom to top, the branches divided and subdivided, and at last terminated with two, three, four, or five, very fine short nodding horns." The branches are commonly perforated in the axils, and the ultimate ones tipped with brown. Their drooping summits are only remarkable when the lichen is in fruit, a state not observed by us in this neighbourhood. A small variety, of a grey colour, is not uncommon on earth-capt dikes in the immediate vicinity.

This lichen is very common on our moors, which, in some places, are whitened with it, but it grows in the greatest profusion in the Arctic Regions, and especially in Lapland, where it covers, as with a covering of snow, plains hundreds of miles in extent. And these, which a stranger or traveller from a happier land might deem dry and barren wastes, are yet the very fertile fields of the Laplanders,—*"hi sunt Lapponum agri, hæc prata eorum fertilissima, adeo ut felicem se prædicet possessor provinciæ talis sterilissimæ, atque lichene obsitæ."* For when the cold of winter has withered up every sort of herbage, and its storms have driven man and beast to the shelter of the valleys and of the woods, this moss becomes the principal aliment of the herds of reindeer, in which consists all the wealth, and on which depends the very existence, of the natives. "Thus things," says LIGHTFOOT, "which are often deemed the most insignificant and contemptible by ignorant men, are, by the good providence of God, made the means of the greatest blessings to his creatures." According to LINNÆUS, the Laplanders likewise collect the *C. rangiferina* with rakes in the rainy season, when it is flexible, and separates readily from the ground, lay it up in heaps, and give it when required to their cows, to which it affords excellent fodder. "At the limits of the arctic circle there is a breed of cows so small as not to be larger than sucking calves. Their milk is almost all cream; sweet and delicious, and so thick that it draws out in strings. This goodness in milk arises from the plant on which the cows feed, viz. the *Lichen rangiferinus*."—BUCKE'S *Harmonies of Nature*, ii. 149.

Cen. rangiferina may even be directly applied to the use of man. Tempted by the beauty of its appearance, Dr CLARKE and his companions in travel tasted it. "To our surprise, we found that we might eat of it with as much ease as of the heart of a fine lettuce. It tasted like wheat bran; but, after swallowing it, there remained in the throat, and upon the palate, a gentle heat, burning as if a small quantity of pepper had been mixed with the lichen. We had no doubt that, if we could have procured oil and vinegar, it would have afforded a grateful salad. Cooling and juicy as it was to the palate, it nevertheless warmed the stomach when swallowed, and cannot fail of proving a gratifying article of food to man or beast during the dry winters of the frigid zone. Yet neither Laplanders nor Swedes eat of this lichen. Finding it to be so palatable, we persuaded our servants to taste it; and, after experiencing the same effects from it that we had done, they began to eat it voluntarily. Upon this, we asked the peasants why they neglected to make use of so important an article of food, in a land so sterile as that which we were now traversing. They told us, that, when GUSTAVUS the Third succeeded to the throne, an edict was published and sent all over Sweden, recommending the use of this lichen to the peasants in time of dearth; and they were advised to boil it in milk. Now and then, they said, a few of the indigent poor had made it serve as a substitute for bread; but being unaccustomed to such food, they generally rejected it."—CLARKE'S *Travels*, part iii. sect. 1. p. 566. Nor is this to be wondered at, for CLARKE had tried it only in a solid and unprepared state, and was incompetent, therefore, to say what sort of food it might really make; which, from the account of DILLENUS, is, in fact, indifferent enough. "Aqua quidem decoctus hic muscus nullam gelatinam præbet, nec substantia ejus imminuitur, siccatus tamen fragilior, quam ante, evadit. Decoctum inspissatum extracti acerbi et austeri parcam quantitatem largitur."

2. *C. uncialis*, yellowish-grey, smooth, erect, dichotomously branched, fistular, perforated at the axils; secondary branches short, patent, tipped with brown radiating points.—HOOK. *Scot.* ii. 64. *Lichen uncialis*, LIGHTF. *Scot.* 880. WITH. iv. 46. *Eng. Bot.* t. 174. DILL. *Musc.* t. 16. f. 21-2.

Hab. On moors, in small cæspitose tufts, or straggling amongst the heath, frequent.

3. *C. gracilis*, greenish-brown, smooth, leafy at the base, dichotomous or simple, the apices subulate, or dilated into small imperfect cups toothed on the margin, and tuberculated with dark brown apothecia.—HOOK. *Scot.* ii. 63. *Lichen gracilis*, WITH. iv. 39. LIGHTF. *Scot.* 873. *Eng. Bot.* t. 1284. DILL. *Musc.* t. 14. f. 13. C. D. E.

Hab. Moors, frequent.

* * *Foliaceous, with cup-bearing stalks. (The barren stalks are sometimes subulate.)*

4. *C. bellidiflora*, leafy, ash-grey, smooth, lobed, white and naked beneath; fruitstalk $1\frac{1}{2}$ inch high, thick, attenuated upwards, very rough with foliaceous scales, and terminated with a large scarlet conglomerate tubercle.—HOOK. *Scot.* ii. 64. *Lichen bellidiflorus*, *Eng. Bot.* t. 1894.

Hab. Mountainous heaths. Cheviot, Dr James Thompson.

5. *C. coccifera*, leafy, lobed, lobes small, crenate, raised, ash-grey, beneath white and naked; stalks cylindrical or dilated, rough, often foliaceous, cupped, the fructification scarlet clustered tubercles.—HOOK. *Scot.* ii. 63. *Lichen cocciferus*, LIGHTF. *Scot.* 866. WITH. iv. 41. *Eng. Bot.* t. 2051. DILL. *Musc.* t. 14. f. 7.

Hab. On the Lammermuirs, abundant, and very conspicuous by its

“ ——— cups, the darlings of the eye,
So deep is their vermilion dye.”

6. *C. digitata*, foliaceous, segments minute, expanded, rounded, crenate, pulverulent beneath, as well as on the cylindrical yellow-green cup-bearing stalks; cups narrow, small, at length large, proliferous, the rays tipped with the bright scarlet apothecia.—HOOK. *Scot.* ii. 63. *Lichen digitatus*, LIGHTF. *Scot.* 874. WITH. iv. 42. *Eng. Bot.* t. 2439. DILL. *Musc.* t. 15. f. 19.

Hab. On decayed roots of trees. In the woods about Renton Inn.

In our specimens, the leaves are stained with a rich orange-yellow on the under surface.

7. *C. pyxidata*, foliaceous, irregularly lobed, lobes somewhat imbricate, crenate, ash-grey, granular, beneath white; stalks cyathiform, rough, the margin of the cup entire or proliferous, with brown fructification.—HOOK. *Scot.* ii. 62. *Lichen pyxidatus*, LIGHTF. *Scot.* 869. WITH. iv. 38. *Eng. Bot.* t. 1393. DILL. *Musc.* t. xiv. f. 6.

Hab. On the ground, in heathy places, gravelly banks, and on the sides of earthen dikes, very common.

“The powder of this lichen,” says GERARDE, “given to children in any liquor for certaine dayes together, is a most certaine remedie against that perrillous malady called the chincough.”

8. *C. fimbriata*, foliaceous, irregularly lobed, lobes crenate, ash-grey, white beneath; stalks pulverulent, rough, cylindrical, expanding into a cup, the margins of which are toothed or deeply jagged.—HOOK. *Scot.* ii. 62. *Lichen fimbriatus*, LIGHTF. *Scot.* 870. WITH. iv. 39. *Eng. Bot.* t. 2438. DILL. *Musc.* t. xiv. f. 8.

Hab. Gravelly banks on heathy places, frequent.

This is considered by many, as it seems to me very properly, a variety of the preceding.

54. SPHÆROPHORON.

1. *S. coralloides*, stem dichotomous, smooth, branches very short, forked, clustered; apothecia globose, smooth.—HOOK. *Scot.* ii. 67. *Lichen globiferus*, LIGHTF. *Scot.* 887. WITH. iv. 43. DILL. *Musc.* t. xvii. f. 35.

Hab. On moss grown rocks. Murton Craigs. Penmanshiel Wood, &c.

2. *S. fragile*, coralloid, cæspitose, dichotomous, greyish and rough; apothecia somewhat warted.—HOOK. *Scot.* ii. 67. GREV. *Fl. Edin.* 347. t. iii. f. 16. *Lichen fragilis*, LIGHTF. *Scot.* 888. WITH. iv. 43.

Hab. Similar places to the preceding.

The *Sph. coralloides* has a distinct stem, which is branched in a dichotomous manner, beset on all sides and at the summits with clusters of slender short patent forked branch-

lets. It is smooth, somewhat glossy, and of a light or chestnut-brown, about 2 inches in height. When moist, the stem, as WAHLENBERG remarks, is tough, so that it tears, and will not break. *Sph. fragile*, on the contrary, is a smaller plant, of a greyish colour, without any gloss, and the stem is not distinguishable from the branches, the whole constituting a dichotomously branched frond. It is very fragile, and much resembles a coralline.

55. BÆOMYCES.

1. *B. rufus*, crust spreading, greenish-grey, uneven, granular; apothecia on whitish somewhat compressed short stalks, small, reddish-brown, smooth, convex.—HOOK. Scot. ii. 65. *Lichen byssoides*, LIGHTF. Scot. 809. Eng. Bot. t. 373. *Patellaria rufa*, SPRENG. Syst. Veg. iv. 269. DILL. Musc. t. xiv. f. 5.

Hab. On gravelly banks in heathy places. Road-side near Houndwood Inn, with *Polytrichum aloides*, abundant, producing its fruit in early spring.

56. ISIDIUM.

1. *I. corallinum*, "crust tartareous, at length cracking, greyish-white; podetia minute, varying in length, cylindrical, smooth, simple or branched, disk of the fructification brownish-grey."—GREV. Fl. Edin. 346. t. iii. f. 15. HOOK. Scot. ii. 66. *Lichen corallinus*, LIGHTF. Scot. 808. WITH. iv. 17.

Hab. Rocks in heaths. Humbleton Dean, near Wooler, James Mitchell, Esq. R. N. Murton Craigs, plentiful.

Without a close examination this may be overlooked as the crust merely of *Lecanora tartarea*. LIGHTFOOT's description is excellent. "At first view this appears to be only a white tartareous crust, about $\frac{1}{5}$ th of an inch thick, with an unequal surface, formed into knobs or buttons; but being broken and examined with a microscope, it is found to consist of compact bundles of short, round, stony, branched, coral-like fibres, the branches all obtuse and even at the top, without tubercles." In this country it is always of a grey colour; but, according to Dr CLARKE, in Scandinavia, the gradations of colour, from white to brown, black, and red, are very remarkable; and sometimes all these gradations might be observed upon the same specimen. The red colour was always the most vivid where

the red *felspar* of the granite, upon which the plant grew, was most predominant.—*Travels*, part i. p. 565. WESTRING found it extremely rich in colouring matter, and recommends it to the particular attention of those who practice, and who wish to improve, the art of dyeing. A short abstract of his experiments is given by Mr NEILL in the *Edinburgh Encyclopædia*.

57. GYROPHORA.

1. *G. proboscidea*, frond a circular concave leaf adherent by the centre, of a brownish-black colour, more or less torn and plaited at the margin; upper surface sprinkled with small inconspicuous tubercles, wrinkled and lighter coloured in the middle; beneath brownish, smooth.—*Eng. Bot.* t. 2484. (The figures agree well with our specimens.) *Hook. Scot.* ii. 41. *Lichen deustus*, LIGHTF. *Scot.* 861.

Hab. Rocks near the summit of Hedgehope.

2. *G. cylindrica*, umbilicated, irregularly lobed, dark greenish-grey, fringed with black rigid hairs; tubercles elevated, nearly plane, with concentric and plaited lines.—*Hook. Scot.* ii. 42. *G. proboscidea*, WINCH, *Guide*, ii. 43. *Lichen crinitus*, LIGHTF. *Scot.* 860. *L. proboscideus*, *Eng. Bot.* t. 522. *DILL. Musc.* t. xxix. f. 116.

Hab. On Cheviot, Winch. Near the summit of Hedgehope, plentiful.

Used as food in Iceland; as also for dyeing woollen stuffs of a brownish-green colour.

58. OPEGRAPHA.

1. *O. Persoonii*, crust thin, whitish, leprous, undefined; apothecia raised, aggregate, somewhat branched, linear, black, rugose.—*Eng. Bot.* t. 2345. *Hook. Scot.* ii. 42.

Hab. On sandstone rocks at Hudshead, and on stone walls in the vicinity, abundant.

The apothecia are generally, as it were, heaped upon one another, and assume a star-like form.

2. *O. atra*, crust membranaceous, white; apothecia sessile, linear, flexuose, free, channelled along the middle.—SCHÆRER. *O. denigrata*, SMITH in *Eng. Bot.* (ARNOTT in *Litt.*)

Hab. On the bark of various trees, particularly the hazel and the ash, very common.

For the specific character, which is a translation of SCHÆRER's, I am indebted to Mr ARNOTT, who also determined my specimens. The crust is thin, even, smooth, silvery white, undefined, except when it comes in contact with another frond, when the point of separation is marked by a black line. The apothecia are black, raised, variable in length, mostly simple, but occasionally branched, numerous, free, or somewhat clustered, and slightly tapered at each end. The disk is rather narrow. Notwithstanding its commonness, this is the first time it has been described as a native of Scotland.

3. *O. notha*, crust very thin, spreading, greyish-white; apothecia scattered, black, short, oblong, with a broad disk.—GREV. *Fl. Edin.* 352. *Eng. Bot.* t. 1890.

Hab. On the bark of the ash, not common.

4. *O. scripta*, crust spreading, thin, smooth, greyish-white; apothecia black, immersed, flexuose, anastomosing or somewhat stellate.—GREV. *Fl. Edin.* 353, t. iii. f. 3. indifferent. *Graphis scripta*, HOOK. *Scot.* ii. 43.

Hab. Bark of trees, particularly of hazel, frequent.

The apothecia burst through the crust, leaving the margins a little raised, and uneven or lacerate. The *Lichen scriptus* of LIGHTFOOT obviously embraces several species now considered distinct.

5. *O. macularis*, crust roughish, brownish-black; apothecia clustered, roundish-elliptical, rugose, irregular, black.—HOOK. *Scot.* ii. 43. *O. epiphega*, *Eng. Bot.* t. 2282. *Graphis macularis*, SPRENG. *Syst. Veg.* iv. 250. *Lichen rugosus*, LIGHTF. *Scot.* 802. WITH. iv. 4.

Hab. On the smooth bark of trees, of young oaks in particular, common.

Forms black roughish spots or patches. The branches of young oaks are sometimes so completely overrun with it,

that they look as if they had been smoked, or rubbed over with gunpowder.

59. ARTHONIA.

1. *A. astroidea*, crust thin, even, white or greyish-white; apothecia black, numerous, even with the crust, rounded, more or less stellate.—Hook. Scot. ii. 36.

Hab. On the bark of the ash and elm, occasionally.

2. *A. swartziana*, crust thin, even, greyish-white; apothecia black, even with the crust, numerous, short, somewhat linear, irregularly branched.—Ach. Syn. Lich. 5.

Hab. On the ash, near the Retreat, Berwickshire.

When I mention that the names to my specimens were attached by Mr ARNOTT, I need scarcely add that no doubt can be entertained of the correctness of their application. I have described them without reference to the descriptions of others, and to me the species appear too nearly related.

60. SPILOMA.

1. *S. tumidulum*, crust very thin, even, greyish-brown; apothecia tile-red, irregularly oblong, crowded, rough or granular.—Hook. Scot. ii. 35.

Hab. On the bark of trees. On the hazel in the dean at the Pease-bridge.

61. VARIOLARIA.

1. *V. amara*, crust rugose, cracked, uneven, subpulverulent, white or greyish; warts of the apothecia appressed, plano-concave, margined, bearing soridia of the same colour as the crust.—Hook. Scot. ii. 46. *Lichen fagineus*, LIGHTF. Scot. 807. WITH. iv. 4.

Hab. On the bark of the ash, birch, and oak, not uncommon.

The crust of this lichen is intensely bitter, and it imparts this bitterness readily both to water and alcohol. BRA-

CANNOT found in the 100 parts, 18 parts of lime, combined with 29.4 of oxalic acid. Nearly the same quantity of oxalate of lime was found in *Porina pertusa*, *Isidium corallinum*, *Lecanora tartarea*, and some others which do not occur in this neighbourhood. "The oxalate of lime bears the same relation to the Cryptogamia as carbonate of lime to corals, and phosphate of lime to the bony structure of the more perfect animals. The oxalate of lime diminishes gradually in the family of lichens, in proportion as the species lose their granular crustaceous texture, and approach more and more to the membranous or cartilaginous, although these latter also contain a considerable quantity of this salt. From the vast abundance of these lichens, it is evident that they may afford a means of obtaining oxalic acid in great quantity, and at a cheap rate."—*Edin. Phil. Journ.* xiii. 194.

62. VERRUCARIA.

1. *V. epigea*, crust yellowish-green, thin, granular when dry; apothecia small, tubercle-like, dull black, with a central lighter coloured nucleus.—ACHAR. *Synop.* 96. *Lichen terrestris*, *Eng. Bot.* t. 1681.

Hab. Dry barren banks, near Berwick, rare.

ACHARIUS says the tubercles are black internally, but in our specimen the nucleus is rather buff coloured. When wet, the crust is soft and somewhat slimy.

2. *V. epidermidis*, "crust exceedingly thin, spreading, quite white; fructification minute, roundish, sub-elliptical, tubercles semi-immersed, the interior white."—GREV. *Fl. Edin.* 353.

Hab. On the bark of the birch, rather rare.

63. PORINA.

1. *P. pertusa*, crust bluish-grey, even, thin, spreading, tubercular or warted, the warts perforated or marked with depressed black points, internally cellular, whitish.—HOOK. *Scot.* ii. 45. *Lichen pertusus*, LIGHTF. *Scot.* 802. WITH. iv. 16. *Sphæria pertusa*, BOLT. *Fung.* t. 126. DILL. *Musc.* t. xviii. f. 9.

Hab. Trunks of trees, most common on ash.

The *Porina leioplaca* of ACHARIUS (MOUG. and NEST., No. 847.) is surely nothing but *P. pertusa* in an early state, but if it is to be considered a distinct and perfect species, it must be added to the British list of lichens, for I have gathered it in Berwickshire on the birch, and it is probably far from uncommon.

64. ENDOCARPON.

1. *E. Weberi*, frond depressed, thick and somewhat leathery, foliaceous, lobed; lobes crowded, the interior irregularly convolute, raised, the exterior undulate with rounded sinuate margins; upper surface greenish-grey, smooth, beneath fawn coloured and smooth; orifices punctiform, black, slightly raised.—HOOK. *Scot.* ii. 45. GREV. *Fl. Edin.* 329. DILL. *Musc.* t. 30, f. 127.

Hab. On rocks by the sides of rivulets. On the linn in Humbledon Dean above Wooler, abundant, W. C. Trevelyan, Esq.

On drying, the colour of the upper surface becomes a greyish-pink.

65. LEPRARIA.

1. *L. flava*, crust spreading, equal, thin, somewhat cracked, bright yellow, composed of sub-globose granules.—HOOK. *Scot.* ii. 73. *Eng. Bot.* t. 1350. *Lichen flavus*, WITH. iv. 3. *Byssus candelaris*, LIGHTF. *Scot.* 1005.

Hab. On timber long exposed to the weather; and, with LIGHTFOOT, “we have sometimes seen it cover old mosses, which appear exactly as if they had been powdered with flour of brimstone.”

2. *L. latebrarum*, grey, pulverulent, undefined, thick; granules mixed with fibres. HOOK. *Scot.* ii. 73. *Eng. Bot.* t. 2147. (*too green.*)

Hab. On rocks in caverns, and on stumps of hawthorn at the roots of old hedges, common.

In caverns and in crevices this ambiguous thing “forms light convex soft cushions, easily separable from the rock, their central part being elevated by age, and in a manner vaulted underneath.” It is thinner when growing on trees, the

base of which, in shaded situations, it often covers with a light grey pulverulent coat; and in this latter situation I have found, lying on the crust, small spherical bodies of a shining red colour, which are a species of *Sphaeria*.

3. *L. alba*, pure white, uniform, pulverulent. *Eng. Bot.* t. 1349.
Lichen albus, WITH. iv. 1. *Byssus lactea*, LIGHTF. *Scot.* 1007.
Lecidea alba, HOOK. *Scot.* ii. 38.

Hab. On hypna and lichens in shaded situations, common, making them appear as if they had been white-washed.

The *Lepraria* have but slight claims to be considered perfect plants. They appear to be true lichens struggling for existence in places unsuited to their full development, and altered in appearance by their situation.

Besides those partial uses which have been mentioned under particular species, lichens play a most important part in the establishment of vegetation at the surface of the globe. "When we remark the hardness, the dryness, and the bareness of rocks, we should scarcely imagine that their summit might one day be crowned with forests; and yet this great work is carried on under our eyes, and even in the midst of our habitations. We observe the walls covered with greenish spots, which grow from humidity, and which the light and heat reduce to black and tenacious spots; these are so many *byssi* which have essayed to establish vegetation there, as well as upon the most polished statues and marbles; it is they which impress the seal of age upon our old castles and gothic edifices. Elsewhere, particularly upon rough stones, we see spreading out into broad plats those lichens of various colours, like the ulcerous crusts which corrode the skin of animals; they scoop out and corrode the surface of rocks, and deposit in the vacuities which they have formed, the portion of earth produced by their destruction. Although in very small quantity, this earth suffices to administer to the development of lichens of a higher order. Their debris, added to those of the former, furnish a small layer of earth sufficient for the existence of mosses of an inferior order, to which, in like manner, succeed more vigorous species." *Edin. Phil. Journ.* xvi. 66. See also the *Quart. Review*, vol. xxxviii. p. 438.

“ Seeds, to our eye invisible, will find
On the rude rock the bed that fits their kind ;
There, in the rugged soil, they safely dwell,
Till showers and snows the subtle atoms swell,
And spread th’ enduring foliage ;—then we trace
The freckled flower upon the flinty base ;
These all increase, till in unnoticed years
The stony tower as grey with age appears .
With coats of vegetation, thinly spread,
Coat above coat, the living on the dead :
These then dissolve to dust, and make a way
For bolder foliage, nursed by their decay :
The long-enduring Ferns in time will all
Die and depose their dust upon the wall ;
Where the wing’d seed may rest, till many a flower
Shew *Flora’s* triumph o’er the falling tower.”

CRABBE.

ORDER VII.

FUNGI.

“ To sit on rocks, to muse o’er flood and fell,
 To slowly trace the forest’s shady scene,
 Where things that own not man’s dominion dwell,
 And mortal foot hath ne’er or rarely been ;
 To climb the trackless mountain all unseen,
 With the wild-flock that never needs a fold ;
 Alone o’er steeps and foaming falls to lean ;
 This is not solitude ; ’tis but to hold

Converse with nature’s charms, and see her stores unroll’d.”

BYRON.

Obs.—The Fungi are distinguished from the Lichens by their want of a crust or frond independent of the organs of fructification ; and from the Algæ, by never vegetating under water, and by differences in habit and structure, which a little practice enables the student to seize and appreciate without difficulty and with tolerable certainty. The mushroom and the mould afford the most familiar examples of the class, which includes also the various vegetable parasites, whether solid or pulverulent, which sprout from decaying wood, or spot the leaves of phænogamous plants. In habit the Fungi vary infinitely, and in general they have little resemblance to the plants of any other order. Some resemble an umbrella, some a piece of honeycomb ; others are cups in miniature ; others again simulate a ball, a club or a mace, or assume the forms of the sea-corals ; while many defy comparison with any familiar objects, and grow in figures peculiar to themselves. In texture they are corky or fleshy, soft and gela-

tinous, or formed merely of tubular filaments. A few of them are of less than ephemeral existence; others attain maturity slowly, and remain unchanged for a very long period; while the greater number, although surviving the day of their birth, are still of quick growth and short duration. Species of a green colour are very rare amongst them, and in these few it is merely superficial; but they exhibit all the other colours in every variety of shade, and the tints are often very brilliant. "In the coloured drawings of the more perfect plants," says Dr FLEMING, "the artist is sometimes too profuse in tints, and the figures exhibit a gaudy aspect; but in the colouring of figures of the fungi, he need be under little apprehension of committing excess. Nature having withheld from this portion of her plants those flowers which form the chief beauties of the higher orders, and even the leaves with which they are clothed, has profusely scattered her colours over the whole surface of the mushrooms, ornamenting the cap with one colour, the gills with a second, and the stem with a third. Let but the lover of natural history free his mind from prejudice, and then examine the forms and colouring of the fungi, and he will be compelled to admit, that many of them rival in symmetry and splendour the rose and the lily, those gaudy ornaments of Flora."

The seeds of fungi are produced either on the external surface or internally. They are exceedingly minute and multitudinous, generally globular and pellucid, either naked, or more commonly contained in capsules of various forms. They begin to vegetate and develope themselves when our trees and herbs assume the livery of decay—the "sere and yellow leaf;" and they appear in almost every possible variety of situation. The manner in which they are thus widely disseminated is one of the most curious and perplexing inquiries in vegetable physics. I cannot think that the doctrine of equivocal generation, entertained by the earlier writers, and of late revived from the slumber of at least a century, by some modern botanists, affords any admissible explanation of the phenomena. Its advocates dwell much and long upon some isolated experiments and facts, until, apparently, they forget that these facts are very few indeed, when compared with those from which has been deduced the law that every living being originates from an organized body produced by its like. That this is the

ordinary mode of dissemination of the fungi even, cannot be denied; and were the facts which oppose its extension to every cryptogamous species more numerous than they are, yet it might be the safer course to leave their explanation to future inquiry, than to call in the aid of a supposititious agent. But the facts alluded to do not, properly speaking, stand in opposition to the usual doctrine of vegetable reproduction. Some plants, more particularly some fungi and algæ, appear under circumstances and in situations where, it is said, the presence of seeds is improbable or inconceivable; but the improbability may proceed from our inability to trace the secret operations of nature, or from limited investigations. To find facts inexplicable by a theory acknowledged to be true, is not strange or even uncommon, but it seems surpassing strange to suppose that atoms of unorganized matter can unite themselves with similar atoms so as to assume forms unvaried by differences in time and place, and such an organization as admits the play of life and its usual signs, so that even these parentless things produce a seed, and can and do afterwards propagate their likes! The mushroom, for example, has been instanced as a very genuine production of equivocal generation, but we well know that mushrooms shed a copious seminal powder, and are often propagated by it. When, indeed, I ask myself what equivocal generation is, I can form no other conception of it than of something analogous to chemical affinity, which may build up fabrics as beautiful as are exhibited in mould, but which no one has ever confounded with the lowest of vegetable forms;—so wide is the interval which separates living from dead matter; and this difference the hypothesis fails to explain. Nor, perhaps, would I be much in error, were I to place equivocal generation among those causes which are purely figments of the mind;—which, like “great Comus,” may “inveigle and invite the unwary sense,” and give us the possession of a fancied knowledge, to continue only until reason shall “unlock the clasping charm” of a name, and restore us to ignorance and truth.

But while I receive unconditionally the doctrine of Harvey—*omnia ex ovo*—I am not disposed to maintain that every thing described in our systems as fungi are disseminated in accordance with it. Many fungi appear to be merely morbid alterations in the structure of vegetable textures, or diseased growths,

analogous, in some respects, to the tumours and ulcerations of the animal system; and we may, perhaps, form some idea of the manner in which they may originate, by studying the various galls and excrescences produced in plants by insects. We observe that the irritation caused by the deposition and evolution of the egg will produce growths of the most curious kind; and differences in the irritation too slight to be traced, will occasion very remarkable differences in the appearance of the growths. Thus in the oak-leaf one insect irritation produces a globular smooth ball; another a depressed circular tumour, covered with a hairy scarlet coat. The first is seated in the substance of the leaf, and cannot be removed without destroying the texture of the part; the other seems almost placed on the leaf, and can be detached with facility. Examples equally remarkable will occur to every one who has paid any attention to this curious subject; and the growths appear to be not less uniform and not less organized than many parasitical fungi. To suppose, therefore, that the latter may be the result of irritations and obstructions in the cellular parenchyma or in the circulating juices, seems not unreasonable, although the sources of the obstruction or irritation may be undiscoverable.

* *Fungi of a hard or corky texture. With a few exceptions, they are very small, sessile, mostly of a black colour, never white: they grow on wood and leaves generally when in a state of decay: their seeds are internal, immersed in a soft or pulpy parenchyma.*

† *Seeds contained in slender crystalline tubes.*

66. SPHÆRIA. Fungi—globular or flask-shaped horny capsules, naked or immersed in a corky or charred base, each opening by a pore in the summit.
67. DOTHIDEA. Fungi—wart or tubercle-like spots semi-immersed in leaves, cellular within; cells excavated in the mass, and without pores.
68. PHASCIDIUM. Fungi—solid roundish tubercles, opening with a torn stellated orifice; parasitical on leaves.

69. **RHYTISMA.** Fungi—circular swollen spots originating in the substance of leaves; surface obsoletely furrowed, opening at length by transverse or irregular flexuose clefts; internally solid, homogeneous.
70. **HYSTERIUM.** Fungi—solid oblong or linear sessile tubercles furrowed with a mesial cleft parallel to the longest diameter.

† † *Seeds diffused in the interior, globular.*

71. **SCLEROTIUM.** Fungi—solid globose or oblong tubercles without aperture or dehiscence; internally smooth and homogeneous.
72. **XYLOMA.** Fungi—circular plane spots or dots in leaves verging to decay, without orifice or cleft; internally solid, homogeneous.
73. **CEUTHOSPORA.** Fungi—depressed spots (black) in leaves, opening at last irregularly; seeds collected into an internal black nucleus.
74. **ERYSIPHE.** Fungi—minute spherical tubercles filled with globular seeds, and placed on a white filamentous cobweb-like base; parasitical on living leaves.

† † † *Anomalous.*

75. **RHIZOMORPHA.** Fungi—much branched, elongated, solid, ligneous, resembling the roots of shrubs: growing between the bark and wood of decayed trees.

* * *Fungi soft or gelatinous, homogeneous, sessile; seeds naked, diffused internally. On decayed wood and plants.*

76. **DACRYMYCES.** Fungus sessile, rounded, gelatinous, smooth; internally filamentous, the filaments ascending with the seeds interspersed. Small, gregarious. *Hab.* decayed wood.
77. **ILLOSPORIUM.** Fungus soft, subgelatinous, entirely formed

of minute, globular, pellucid grains. Small, red. *Hab.* on lichens.

78. **TREMELLA.** Fungus gelatinous, subpellucid, polymorphous, lobed or plaited; seeds scattered, placed near the surface. (Large or middle-sized, variously coloured, bursting from under the bark.)

79. **PODISOMA.** Fungus gelatinous, conical, composed internally of pellucid unilocular capsules. Parasitical on the living juniper.

80. **TUBERCULARIA.** Fungus wart-like, fleshy, compact, subsessile; granules very small and numerous, immersed in the superior and cortical layer. Parasitic on the bark of trees and shrubs.

* * * *Fungi fleshy or coriaceous; texture fibrous; seeds very minute, produced externally, generally contained in slender tubes. (Mostly large and of short duration: colours various, but seldom black.)*

† *External surface even.*

a. Depressed.

81. **CENANGIUM.** Fungus subsessile, attached by the centre beneath, plaited; disk at first closed, at length more or less open, smooth, seminiferous; the seeds in erect hyaline tubes. (Coriaceous, small, gregarious, bursting from under the bark of branches.)

82. **PEZIZA.** Fungus fleshy or waxy, saucer or cup-shaped, sessile or stalked, affixed by the centre beneath; the disk smooth, seminiferous; seeds in hyaline tubes.

b. Erect.

83. **TYPHULA.** Fungi club-shaped, the stalk slender, filiform, sprouting from a radical tuber. Parasitical.

84. **CLAVARIA.** Fungi fleshy, erect, simple or branched; the

seminiferous tubes confined to the upper parts. Terrestrial.

85. **LEOTIA.** Fungi between fleshy and gelatinous, stalked; stalk central, terminated with a rounded and marginated cap, smooth on both surfaces. Terrestrial.

†† *External surface honeycombed or cellular.*

86. **MORCHELLA.** Fungi fleshy, stalked, the pileus honeycombed, confluent with the stalk either at the margin or a little above it. Large, terrestrial.

87. **PHALLUS.** Fungus cellular, stalked, the stalk issuing from a wrapper; pileus furnished with large cells filled with a slimy seminiferous matter. Large, terrestrial.

††† *One surface porous or prickly.*

88. **BOLETUS.** Fungi fleshy, with a convex and circular pileus on a central stalk; pileus porous beneath, the tubes separable from the substance of the pileus and from each other. Terrestrial.

89. **POLYPORUS.** Fungi suberose or coriaceous, sessile, or rarely with a short lateral stalk; under surface porous, the pores not separable from each other, nor from the substance of the fungus.

90. **AURICULARIA.** Fungi flat, expanded, coriaceous, smooth or hairy on the upper side, fixed by the whole under surface which is smooth or papillary, and becomes detached and reversed in age.

91. **HYDNUM.** Fungi fleshy or coriaceous, stalked or sessile, the under surface bristled with awl-shaped processes or spines.

†††† *One surface lamellated or veined.*

92. **AGARICUS.** Fungi with a pileus or cap furnished beneath with lamellæ or gills radiating from a centre, and differing in substance from the rest of the fungus.

93. **CANTHARELLUS.** Fungi fleshy or membranaceous, plaited beneath, with raised veins of a similar substance, radiating, subparallel, dichotomous, sometimes anastomosing.

* * * * *Fungi filled with a copious seminal powder enclosed in a membrane, sometimes double. (The membrane or outer coat (peridium) is of a fibrous structure. The interior is pulpy at first, becomes gradually more consistent, at last pulverulent, when it is discharged by irregular ruptures of the coat.)*

94. **SCLERODERMA.** Globular, sessile. Peridium coriaceous, indurated, mostly warty, bursting at the apex. Seeds collected into little contiguous distinct globules, mixed with filaments.

95. **LYCOPERDON.** Globular, sessile or obsoletely stalked. Peridium membranous, often warted, bursting irregularly at the top, filled with a soft pulverulent and fibrous mass.

96. **LYCOGOLA.** Sessile, globose or subirregular. Peridium thin, fragile, variously dehiscent, the seminal mass very pulverulent and mixed with few fibres.

97. **ONYGENA.** Stalked with a globular head, which is covered with a crustaceous membrane bursting irregularly; seminal mass compact, pulverulent, without fibres.

98. **LEOCARPUS.** Minute, somewhat stalked. Peridium crustaceous, fragile, bursting, containing a black seminal mass mixed with a few filaments.

99. **CRATERIUM.** Fungi minute, cyathiform, smooth, membranous, truncate at the top; and closed by a plane diaphragm; filled with pulverulent seeds intermixed with slender filaments.

100. **PHYSARUM.** Minute, stalked, the head subglobose, covered with a thin membrane, bursting and deciduous in distinct portions. Seeds mixed with filaments.

101. **TRICHIA.** Minute, sessile or stalked, globular or ovate, the outer coat membranaceous, bursting irregularly. Seeds

placed in a fibrous mass, the filaments involute, attached to the base, and expanding elastically.

102. **ARSCYRIA.** Small, stalked, the head ovate-oblong or cylindrical, covered with a membranous coat which soon disappears except a small portion at the base, disclosing a felted fibrous mass, in which the seeds are intermixed.
103. **STEMONITIS.** Small, stalked, the stalk continued through the cylindrical head, and having attached to it the felted or netted filaments in which the seeds are entangled.

***** *Fungi cup-like, containing lenticular bodies filled with the seeds.*

104. **CYATHUS.** Fungus cup-shaped, while young closed by a membrane, afterwards open. Seeds contained in lenticular bodies attached by a pedicel to the bottom of the cup.

***** *Fungi pulverulent, parasitical, bursting from beneath the epidermis of plants.*

105. **STILBOSPORA.** Fungi black, compact, composed entirely of subglobular grains or capsules. *Hab.* branches of trees.
106. **SEPTARIA.** Parasitical on leaves, the seminal mass escaping from an immersed capsule in the form of tendrils, and forming spots on the surface composed of cylindrical jointed pellucid bodies or grains.
107. **PUCCINIA.** Parasitical on living plants in minute coloured spots, and bursting through the epidermis irregularly; spots formed of stalked subpellucid grains divided into 2 or more cells.
108. **URED.** Parasitical on living plants, in minute coloured spots, bursting through the epidermis irregularly; spots formed of subpellucid globular or oval grains undivided.
109. **ÆCIDIUM.** Parasitical on living plants in minute coloured spots; each spot cup-like with a toothed circular border; grains free, minute, globular.

***** *Fungi pulverulent, produced on the external surface of leaves and plants.*

110. **ERINEUM.** Fungi composed of subpellucid, tubular, irregular, and unjointed filaments compacted into an effused spot. Parasitical on living leaves.

111. **FUSIDIUM.** Fungi—plane, effused spots, composed of slender, branched, hair-like filaments, and of minute, crystalline, linear bodies, tapered at each end. On dead leaves.

112. **SEPEDONIUM.** Fungi pulverulent, produced within putrefying fungi, composed of entangled filaments and globular pellucid grains or capsules.

***** *Fungi mould-like, or formed of filaments erect or interwoven.*

† *Filaments short, erect, rigid.*

113. **CLADOSPORIUM.** Filaments tufted, simple, and somewhat branched, jointed only at the apices, the joints separating at last.

114. **TORULA.** Filaments tufted or rather felted, moniliform or jointed; joints contiguous, opaque, sometimes deciduous.

115. **ACROSPORIUM.** Filaments simple, tufted, pellucid, moniliform, the joints separating and deciduous.

†† *Filaments erect and decumbent, pellucid, fugitive.*

116. **MUCOR.** Mould-like; sterile filaments decumbent, webbed; fertile ones erect, jointed, simple, terminated by a globose head covered with a thin membrane, and filled with simple globular grains.

117. **ASPERGILLUS.** Mould-like; sterile filaments decumbent, webbed; fertile ones erect, simple or divided at the top, clavate, with a globular cluster of naked seeds (capsules) on the summits.

118. **PENICILLIUM.** Mould-like ; sterile filaments decumbent, jointed, free, simple or branched ; fertile ones erect, terminated with a pencil-like tuft of branches, among which the globular pellucid seeds are clustered.
119. **BOTRYTIS.** Filaments simple or branched, scattered or compacted, jointed, free ; fertile ones erect, with simple summits ; seeds globose or oblong, collected about the branches or the summits of the filaments.
- + + + *Filaments decumbent, long, interwoven.*
120. **RACODIUM.** Filaments felted, branched, opaque, scarcely jointed, persistent ; the seeds in imperfect clusters scattered amongst the filaments.
121. **BYSSUS.** Filaments branched, interwoven, pellucid, slender, and fugitive.
122. **HIMANTIA.** Filaments creeping, closely appressed to the subjacent body, branched in a radiating manner, unjointed, persistent.

66. SPHÆRIA.

Obs.—The essential character of the *Sphæria* is a globular or flask-shaped capsule of a horny texture, filled with a pulp, in which the slender pellucid tubes containing the seeds are immersed, and which at maturity is discharged by a round aperture in the summit of the capsule. These capsules are often sunk and concealed in a peculiar parenchyma or base, but this is as often entirely wanting. The species grow on dead wood and leaves, except a few which infest leaves before they show any appearance of decay ; and they commence in general under the bark or epidermis, which they perforate and remove, that other agents may carry on the work of ruin they have begun. They are almost all of small size, and of a black, brown, or red colour.

* *Capsules immersed in a peculiar parenchyma.*

† *Fungus-like, erect.*

1. *S. hypoxylon*, clustered, compressed, black and shaggy at the base, the apices cleft, white and mealy when young; black, rough, and sterile at the points when mature.—Sow. *Fung.* t. 55. PERS. *Syn.* 5. HOOK. *Scot.* ii. 4. *Clavaria hypoxylon*, LIGHTF. *Scot.* 1059. WITH. iv. 404. *Xylaria hypoxylon*, GREV. *Fl. Edin.* 355.

Hab. Around the stumps of trees, and at hedge bottoms, common in winter.

Grows in irregular clusters 2 or 3 inches high, more or less branched, of a corky texture, internally white. When the powder is rubbed off, the apices become black like the stem, and it is not until spring that the spherical capsules can be discovered within them. These form a marginal row on each side of a longitudinal section, and some are likewise often, but not always, placed in the interior. They are very obvious, both from their size, and from the contrast afforded by their black colour to the very white pith in which they are immersed. There is a variety smaller and simple, with a distinct cylindrical rough head tapered to a point. This has been called *Sphaeria cupressiformis*. It grows in the same situations, and often intermixed with the other. A reduced figure of it is given in LOUDON's *Encyclop.* No. 16358.

†† *Base adnate, effused, chared.*

2. *S. stigma*, crust widely spreading, brown or black, even, cracked, closely punctured with the minute orifices of the cells; cells globose, entirely immersed, the orifices very slightly prominent; interior white, or ultimately black.—PERS. *Syn.* 21. HOOK. *Scot.* ii. 5. *S. decorticata*, Sow. *Fung.* t. 137. *Stromatosphaeria stigma et decorticata*, GREV. *Fl. Edin.* 357; *Crypt. Fl.* t. 223, f. 2. *

Hab. On dead branches of trees, particularly of hawthorn and beech, originating beneath the bark which it removes, and when the part appears as if it had been chared; very common.

* The figures in this beautiful work are, in every instance in which I have been able to compare them with nature, so uncommonly correct and characteristic, that I could not allow this opportunity to pass without expressing my opinion of its great merit.

3. *S. undulata*, crust widely spreading, dull black, even or irregular, thickly dotted with the rounded somewhat prominent orifices of the cells; cells globular, entirely immersed; interior white.—PERS. *Syn.* 21. HOOK. *Scot.* ii. 5. *Stromatosphæria undulata*, GREV. *Fl. Edin.* 356; *Crypt. Fl.* t. 223, f. 1.

Hab. On dead wood from which the bark has been removed, occasionally.

Principally distinguished from the preceding by the larger, rounded, and more prominent orifices of the cells.

4. *S. atro-purpurea*, crust spreading irregularly, blackish-brown, uneven, cracked; cells entirely immersed, few and small, without apparent orifices; interior brown.—*Bot. Gall.* ii. 681. *S. vogesiaca*, MOUG. and NEST., No. 765.

Hab. On wood without bark, rare.

Differs from *S. stigma* and *undulata* in having fewer cells irregularly arranged, and the orifices of which are either invisible on the surface, or sometimes just perceptible with a magnifier.

5. *S. lata*, crust very thin, widely spread, black, even, continuous, dotted with the prominent obtusely conical orifices of the cells, which are rather large, very numerous and immersed in the wood; interior of the cell white or yellow.—HOOK. *Scot.* ii. 6. GREV. *Fl. Edin.* 357. *Bot. Gall.* ii. 685.

Hab. On wood deprived of its bark.

My specimens were cut from decayed and decorticated branches, probably of *Salix aurita*. The branches were blackened, and had the appearance of being slightly burned. The crust is very thin, and the cells are merely covered by it, for they are immersed in the wood, which is a remarkable character, and distinguishes this well from any of the preceding.

6. *S. flavo-virens*, crust unequal, rugose, black, pulverulent, yellowish-green within; cells subglobose, their orifices somewhat prominent and rounded.—PERS. *Syn.* 22. *S. multiceps*, SOW. *Fung.* t. 394. f. 8. *Stromatosphæria multiceps*, GREV. *Fl. Edin.* 356. *Strom. flavo-virens*, GREV. *Crypt. Fl.* t. 320.

Hab. On dead branches, frequent.

“So many appearances are assumed by this *Sphæria*, that it requires long practice to determine it without examining the interior; the yellow-green colour of the pulverulent *Stroma* is always conspicuous, and is sufficient to decide the species.”—GREVILLE.

7. *S. filicina*, crust glossy black, smooth, thin, spreading in a linear manner; cells very minute, without visible orifices.—SPRENG. *Syst. Veg.* iv. 391. *S. pteridis*, Sow. *Fung.* t. 394, f. 10.

Hab. On the dead stalks of the Braken, common.

Forms linear or irregular spots external to the epidermis, varying from two or three lines to upwards of an inch in length. The cells are entirely immersed, arranged in rows, and so small as only to be seen in the fully developed plant, but then conspicuous enough from their whitish colour.

8. *S. graminis*, crust dull black, raised, forming small oblong spots on the leaves of grasses; cells immersed, the orifices concealed.—PERS. *Syn.* 30. *Bot. Gall.* ii. 695. MOUG. and NEST., No. 876.

Hab. On decaying but still green leaves of grasses, particularly of *Dactylis glomerata* and *Poa annua*.

9. *S. junci*, capsules bursting from beneath the epidermis, minute, rowed, forming small dull black raised oblong spots on the outer surface, often confluent.—SPRENG. *Syst. Veg.* iv. 391.

Hab. On the dead culms of the common rushes, in early spring.

The capsules originate beneath the bark, and penetrate it by their minute points. They are placed in rows evidently determined by the striæ of the stem; and the orifices are either punctiform and free, or concealed and immersed in a black crust, the surface of which is slightly uneven.

10. *S. quercina*, crust thin, spreading, brown, smooth, studded over with tubercles; capsules enclosed in the tubercles, arranged circularly, with rough prominent orifices penetrating the bark.—SPRENG. *Syst. Veg.* iv. 389. MOUG. and NEST., No. 868.

Hab. On decayed branches of oak, abundant.

The crust spreads along the branches under the bark to a

considerable extent, the rough apices of the celluliferous tubercles bursting through it irregularly. The tubercles are about a line in breadth and height, either separate or touching at their base, and in the latter case they form an interrupted line. Each encloses about a dozen of small black cells, which appear to be arranged round a white corky centre; and the surface of the tubercle is roughened by their orifices.

11. *S. faginea*, crust spreading, thin, black; cells closely clustered, semi-immersed, flask-shaped, oblique, with a long neck, 4 or 5 converging and perforating the bark at the same point.—PERS. *Syn.* 44. MOUG. and NEST., No. 179. *S. perforata*, Sow. *Fung. t.* 372, f. 2. *Cryptosphæria faginea*, GREV. *Fl. Edin.* 359.

Hab. On dead branches of beech, abundant.

Rotten branches of beech lying in the open air, are generally marked all over with little circular rough points protruding through the bark. These points, examined by the magnifier, are seen to consist of 4 or 5 minute tubercles, which are the orifices of as many cells beneath. At first the bark is firmly adherent above them, but ultimately it becomes loose, and, although never detached by the fungus itself, it is easily removed, when the structure becomes very obvious. The capsules lie half immersed in the thin base, and lean so obliquely that the necks of 4 or 5 of them meet and penetrate outwards at one point by a sudden bend of the orifices.

+++ *Base adnate, effused, fleshy.*

12. *S. typhina*, crust cylindrical, elongated, orange-colour, dotted, even, the capsules immersed, ovate.—PERS. *Syn.* 29. HOOK. *Scot.* ii. 6. *S. spiculifera*, Sow. *Fung. t.* 274. *Polystigma typhinum*, GREV. *Fl. Edin.* 365. *Stromatosphæria typhina*, GREV. *Crypt. Fl. t.* 204.

Hab. On the culms of living grasses, not uncommon.

The grass affected with this curious parasite mimics the reed-mace (*Typha latifolia*) in its appearance. It surrounds the stalks to an extent varying from half an inch to 2 inches; is white in its earliest state, but in a few days acquires the orange-yellow colour of maturity.

† † † † *Base circumscribed, globose or tubercle-like.*

§ *Cells arranged in the circumference.*

13. *S. fragiformis*, globose, rusty brown, the surface even or tubercled; interior very black, solid; cells in a light coloured layer beneath the surface.—PERS. *Syn.* 9. t. 1. f. 1, 2. HOOK. *Scot.* ii. 4. *Lycoperdon variolosum*, SOW. *Fung.* t. 271. *Stromatosphæria fragiformis*, GREV. *Crypt. Fl.* t. 136.

Hab. On dead branches of the beech in Blackadder plantations.

The size is in general that of a pea, but sometimes it exceeds this considerably. Our specimens belong to the variety *lævis*, figured by Dr GREVILLE.

14. *S. fusca*, tubercle-like, rusty brown, smooth, rather uneven, punctured with the minute orifices of the cells, the base broad, often confluent; interior black; diameter 2–3 lines.—PERS. *Syn.* 12. HOOK. *Scot.* ii. 5. *Stromatosphæria fusca*, GREV. *Fl. Edin.* 356.

Hab. On dead branches of hazel, abundant, placed upon the bark.

15. *S. gelatinosa*, soft, tubercle-like, convex, buff-orange, smooth, the surface dotted with the orifices of the cells, which are placed near the surface and circularly arranged; interior whitish.—SPRENG. *Syst. Veg.* iv. 385. *S. pallida*, PERS. *Syn.* 12.

Hab. On dead fir branches in damp woods, rare. In the plantation at Murton Craigs. Nov.

Sometimes $\frac{2}{10}$ ths of an inch in diameter, generally less, with a white base. The orifices of the cells are not prominent.

§ § *Cells erect, interior.*

16. *S. oblonga*, black, rough, oblong or roundish, bursting transversely through the bark; interior white; cells ovate, inclined, rather large.—SOW. *Fung.* t. 347. f. 7.

Hab. Dead branches of beech.

17. *S. disciformis*, blackish-brown, circular, raised, flat on the top, and dotted with raised points; interior white; cells oval.—

PERS. *Syn.* 24. HOOK. *Scot.* ii. 5. *Stromatosphæria disciformis*, GREV. *Fl. Edin.* 357. *Crypt. Fl.* t. 314.

Hab. Dead branches of beech, abundant.

About 2 lines in breadth, gregarious, but each little fungus distinct and always separate, sitting in a cup formed by the bark of the tree, which is torn into 4 or 5 almost equal segments, aptly mimicking a calyx. The prettiest of our species.

18. *S. ambiens*, black, in small roundish clusters, perforating the bark in irregular wavy subparallel lines; orifices of the cells arranged round a smooth central space.—PERS. *Syn.* 44.

Hab. On dead branches of the hawthorn, covering them to a great extent, rare.

19. *S. convergens*, black, mammillary, concealed by the bark which the necks of the cells perforate, forming a tubercled point; cells ovate, converging.—SOW. *Fung.* t. 374. f. 6. PERS. *Syn.* 46.

Hab. Dead branches of various trees.

The mammillary tubercles are immersed in the true bark which closely covers them, and are rather widely placed. Each encloses several small cells, which converge together, forming a short obtuse neck that perforates the epidermis, where the orifices appear rough or minutely tubercled, arranged round the whitish corky centre.

20. *S. leucostoma*, cells collected into small circular mammillary pustules, distinct, closely covered by the smooth epidermis; disk white, truncate, perforated by 1–3 black orifices of the cells.—BOT. GALL. ii. 687. MOUTG. and NEST., No. 659.

Hab. On dead branches of hawthorn, abundant.

The pustules are about $\frac{1}{2}$ line in diameter, numerous, readily distinguished by their white central dots.

21. *S. stellulata*, black, in round wart-like spots bursting through the bark; surface tuberculate, the little tubercles or orifices rounded, grooved in a stellate manner; cells oval, with a rather long neck.—BOT. GALL. ii. 686.

Hab. On dead branches of the elm, in spots $\frac{1}{10}$ th in diameter, immersed in the true bark, and surrounded by the ruptured epidermis.

22. *S. Laburni*, dark brown, bursting through the bark in roundish wart-like spots; surface tuberculate, the tubercles rough, obtuse, close; internally blackish-brown; cells oblong; diameter from 1 to 3-tenths.—SPRENG. *Syst. Veg.* iv. 395.

Hab. On dead branches of laburnum, in winter, rare.

23. *S. ribesia*, black, bursting through the bark in roundish spots; surface at first even and smooth, when mature minutely granular, the orifices obtuse.—PERS. *Syn.* 14. HOOK. *Scot.* ii. 5. *Stromatosphæria ribesia*, GREV. *Fl. Edin.* 357.

Hab. On dead branches of the red currant.

The spots are about a line in diameter, surrounded by the ruptured epidermis.

24. *S. prunastri*, "deep black, bursting transversely through the bark, oblong, elevated; orifices of the spherules (cells) crowded, level-topped, acutely 4-sided and grooved."—PERS. *Syn.* 37. HOOK. *Scot.* ii. 6. *Stromatosphæria prunastri*, GREV. *Fl. Edin.* 358.

Hab. On dead branches of the sloe.

* * Capsules seated on a parenchymatous base.

25. *S. cinnabarina*, capsules crowded, globose, granulated, dark red, clustered on a softish red base—SPRENG. *Syst. Veg.* iv. 395. *S. decolorans*, PERS. *Syn.* 49. HOOK. *Scot.* ii. 6. *Cucurbitaria decolorans*, GREV. *Fl. Edin.* 359. *C. cinnabarina*, GREV. *Crypt. Fl.* t. 135.

Hab. On dead branches of hawthorn, in small wart-like tubercles, very common.

* * * Capsules without any parenchymatous base.

† Originating under or in the bark of trees.

26. *S. Berberidis*, capsules clustered, black, globular, rough and tuberculate, without any orifice; internally white.—SPRENG. *lib. cit.* 396. *Cucurbitaria Berberidis*, GREV. *Crypt. Fl.* t. 84; *Fl. Edin.* 359.

Hab. On dead branches of the barberry, bursting through the bark longitudinally, and sometimes forming long lines, but more commonly oblong wart-like tubercles.

27. *S. millepunctata*, capsules numerous, distinct, globose, black, small, immersed beneath the epidermis; the orifice very short, obtuse, scarcely exserted.—GREV. *Syn.* 24. *Cryptosphæria millepunctata*, GREV. *Fl. Edin.* 360. *Crypt. Fl.* t. 201.

Hab. On decaying small branches of the ash, which, when infested with it, seem to the naked eye covered with innumerable minute black dots.

28. *S. Tiliæ*, scattered, immersed and covered by the epidermis, dull black, circular, depressed, the margin raised and thickened; orifice central, short, and thickish.—PERS. *Syn.* 84. MOUG. and NEST., No. 660.

Hab. On small decayed branches of Sycamore.

This fungus, about $\frac{1}{12}$ th of an inch in diameter, sits immersed in the meshes of the old and fibrous bark, concealed by the epidermis, which forms a discoloured and rather depressed spot immediately above it. In the centre of this spot the apex of the capsule is visible, but it scarcely protrudes. On removing the epidermis, the *sphæria* is exposed, remarkable from its situation between the meshes of the netted bark. A closely allied species grows on the old stalks of *Epilobium angustifolium*.

† † *Seated upon the bark or wood.*

29. *S. aquila*, capsules seated in a byssoid cinereous base, globular, clustered, large, black, smooth, with a very minute papillary orifice.—Bot. Gall. ii. 697. *S. byssiseda*, GREV. *Fl. Edin.* 363. LOUD. *Encyclop.*, No. 16441.

Hab. On decayed branches, rare. Winter.

The capsules of this fine species are fully as large as the seeds of the Swedish turnip, and are placed either in close apposition, or a little remote, covering in this manner the branch for several inches in extent. Our specimens are on hawthorn, and were gathered in the immediate vicinity of Berwick by my nephew and pupil Mr R. DUNLOP. The form of the capsules is mammillary, and it is as regular as if it had been fashioned in the lathe of the turner. The summit is rounded and encircled with a line, forming an areola around the minute orifice. The byssoid or flocculent base is of a dirty ash colour; the filaments short, rigid, irregularly branched and opaque. Its presence is pro-

bably adventitious, and the species differs from the true *S. mammiformis* in no other character.

30. *S. spermoides*, capsules closely crowded, opaque-black, globular, roughish, corneous, with a very minute papilliform orifice.—PERS. *Syn.* 75. HOOK. *Scot.* ii. 7. GREV. *Fl. Edin.* 363. *Crypt. Fl.* t. 6. *S. bombardica*, BOLT. *Fung.* t. 122. f. 2. SOW. *Fung.* t. 372. f. 4. *Lycoperdon nigrum*, LIGHTF. *Scot.* 1069. t. 31, lower figure.

Hab. On decayed branches and stumps of ash, deprived of its bark, not common.

The capsules are about the size of a common pin's head.

31. *S. pulvis-pyrius*, capsules closely crowded, black, minute, globular, roughish, and more or less furrowed at the top.—PERS. *Syn.* 86. HOOK. *Scot.* ii. 8. GREV. *Fl. Edin.* 365. *Crypt. Fl.* t. 152. f. 2.

Hab. On bare wood, especially on lopped hazel, in rough continuous irregular spots.

The capsules are one-half less than the preceding, but in other respects the species are much alike.

32. *S. sanguinea*, capsules minute, scattered or clustered, arterial blood-red, smooth, ovate, with a papillary apex —BOLT. *Fung.* t. 121. f. 1. GREV. *Crypt. Fl.* t. 175. f. 1.

Hab. On bare wood or bark. On stumps of fir trees in Blackadder plantations. On dead branches of the broom near Berwick.

Discharges its contents by the apex in the form of a worm-like white pulp. The interior of the cell is black, and when the upper half has fallen off, the remaining portion resembles a pretty *Peziza*.

33. *S. moriformis*, capsules gregarious or clustered, obovate, deep black, rough, tuberculate.—PERS. *Syn.* 86. HOOK. *Scot.* ii. 8. GREV. *Fl. Edin.* 364. *S. claviformis*, SOW. *Fung.* t. 337.

Hab. On dead fir wood, not common.

† † † *On other Fungi.*

34. *S. verrucosa*, capsules clustered, subglobose, deep black, tu-

berculate, and hence very rough.—GREV. *Crypt. Fl.* t. 39. *S. rugosa*, GREV. *Fl. Edin.* 364.

Hab. Parasitic on *Polyporus abietinus*, in the plantation above the Retreat; and in Blackadder plantations, Berwickshire.

I think this is not specifically distinct from the preceding.

35. *S. episphæria*, capsules minute, scattered, arterial blood-red, glossy, soft, ovate, becoming cupped.—PERS. *Syn.* 57. GREV. *Crypt. Fl.* t. 175. f. 2.

Hab. On *Sphæria stigma*, scattered over the surface like miniature garnets, frequent.

In the collapsed and cupped state, this minute species resembles a *Pexiza*. Allied to *S. sanguinea*, yet distinct.

++++ Parasitical in seed-vessels.

36. *S. conigena*, capsules very minute, black, bursting through the epidermis.—Bot. Gall. ii. 705. *S. strobilina*, Hook. Scot. ii. 8. MOUG. and NEST., No. 572.

Hab. On dead cones of *Pinus abies*, common.

“Growing on the outside of the scale, and confined to that part which is exposed when the scales are upon the cone.” HOOKER. Very often there is nothing visible except numerous minute black points penetrating the epidermis, but frequently the spots are a little larger, probably from the confluence of two or three of the lesser ones.

The capsules of the ash and the prickles of the rose are much infested with a *Sphæria*, which it would be more curious than useful to distinguish from *S. conigena*.

+++++ On stems of herbaceous plants.

37. *S. patella*, capsules scattered, black, subglobose, cupped, the margin rounded.—PERS. *Syn.* 76. Hook. Scot. ii. 7. GREV. *Fl. Edin.* 353. *Heterosphæria patella*, GREV. *Crypt. Fl.* t. 103.

Hab. On dead stems of the larger *Umbelliferae*, common near Berwick during the winter months.

38. *S. acuta*, capsules gregarious, glossy black, subglobular, collapsing with age, pointed with a central, rather thick cylindri-

cal neck, penetrating the epidermis.—PERS. *Syn.* 62. *Cryptosphæria acuta*, GREV. *Fl. Edin.* 360; *Crypt. Fl.* t. 239. f. 1.

Hab. On the dead stalks of the nettle near the base, and on thistles, common.

Like in shape to a Florence flask, or a bellied spirit bottle, and a piece of the epidermis often encircles the neck like a label. While the epidermis of the plant remains, the parasite is only to be discovered by the protruding black points of the cells, which, however, soon become entirely exposed.

39. *S. doliolum*, capsules scattered, black, smooth, subglobose, with a short obtuse papillary tip.—PERS. *Syn.* 78. HOOK. *Scot.* ii. 7. GREV. *Fl. Edin.* 363. *Cryptosphæria doliolum*, GREV. *Crypt. Fl.* t. 239. f. 2.

Hab. On dead stems of the wild angelica.

40. *S. herbarum*, capsules small, scattered but very numerous, black, smooth, round, depressed; orifice papilliform, piercing the epidermis like minute dots, at length naked.—PERS. *Syn.* 78. HOOK. *Scot.* ii. 7. *Cryptosphæria herbarum*, GREV. *Fl. Edin.* 361.

Hab. On dead stalks of the wild angelica and cow-parsnip, very common.

41. *S. nebulosa*, capsules minute, scattered, forming dark greyish cloud-like spots on the smooth stalks of plants; the orifice somewhat acute, penetrating the epidermis.—PERS. *Syn.* 31. *Cryptosphæria nebulosa*, GREV. *Fl. Edin.* 362.

Hab. On the stalks of the hemlock, in winter.

42. *S. longissima*, capsules very minute, black, so placed as to form long parallel narrow lines on the stem.—PERS. *Syn.* 31.

Hab. On the dead stems of *Chærophyllum sylvestre*, in winter.

43. *S. culmifraga*, capsules very minute, immersed, scattered, numerous, black; orifice short, conical, bursting through the epidermis.—SPRENG. *Syst. Veg.* iv. 403.

Hab. On the dead culms of the sea-reed or bent, most abundant.

Notwithstanding its minuteness, the hyaline tubes which contain the seeds are readily discovered in this species.

44. *S. calva*, capsules gregarious, small, black, hemispherical, covered with black rigid hairs, which ultimately disappear except about the base.—PERS. *Syn.* 74. GREV. *Fl. Edin.* 364.

Hab. On the dead stalks of the common ragwort, common in early spring.

+++++ *On leaves.*

45. *S. setacea*, capsules immersed, minute, black, scattered, tipped with a long setaceous black point.—PERS. *Syn.* 62.

Hab. On the dead leaves of the sycamore and birch, in winter.

This species prefers the stalks and nerves of the leaf, but is not confined to them. The bristle-like points are apt to be rubbed off.

46. *S. Coryli*, black; capsules distinct, arranged in an irregular circle, the orifices exerted like spines, and surrounded at their base with a white fimbriated collar. SPRENG. *Syst. Veg.* iv. 394. GREV. *Crypt. Fl.* t. 330. *Cryptosphæria gnomon*? GREV. *Fl. Edin.* 360.

Hab. On the green and vigorous leaves of the hazel, not common.

One of the neatest and most curious species in the genus. The orifices point from the under side of the leaf, but the base of the cells is very visible and somewhat prominent on the opposite surface.

47. *S. rubens*, capsules black, distinct, clustered on a red circular spot of the leaf, prominent, the apex obtuse and rounded.

Hab. On the upper surface of the living leaves of the roan-tree. In the wood at the Pease Bridge. July.

The leaves are marked on both sides with bright red circular spots from 2 to 4 lines in diameter, thickly studded on the upper surface with prominent dot-like tubercles or cells, reddish at first, but soon becoming black. I do not perceive any orifice in the apex; and the fungus may perhaps belong to the genus *Dothidea*.

48. *S. Ægopodii*, black, minute, somewhat prominent and roundish, scattered or clustered, placed in pale coloured irregular spots. PERS. *Syn.* 89. HOOK. *Scot.* ii. 8. MOUG. and NEST. No. 281. *Cryptosphaeria Ægopodii*, GREV. *Fl. Edin.* 362.

Hab. On the green leaves of the gout-weed, in summer and autumn, scattered over pale spots which map the whole leaf, and seem determined in their outline by its reticulation.

49. *S. Angelicæ*, scattered but very numerous, minute, black, prominent, roughish, the apex obtuse or depressed. *S. punctiformis*, var. *Angelicaria*, DECAND. *Fl. Franc.* vi. 145.

Hab. On the inferior side of the leaves of the wild angelica in autumn, common.

Nearly allied to the preceding. The portions of the leaf infested with it assume a pale-yellow colour, but sometimes the whole leaf is covered, and without visible discoloration. It is only found on the inferior surface.

50. *S. maculiformis*, minute, point-like, roundish, black, clustered on small squarish and blackish spots. PERS. *Syn.* 90. MOUG. and NEST., No. 661.

Hab. On oak, chestnut, and also on birch leaves, common, opening on the inferior surface.

On comparing my specimens with those in MOUGEOT and NESTLER's collection, I find them precisely similar,—a circumstance I mention because the species, notwithstanding its commonness, has not previously been introduced into any British Flora. It infests decaying oak, chestnut, and birch leaves in autumn and winter. The capsules have their origin beneath the epidermis, and several are collected together into small squares, or irregular spots of a blackish colour, each spot dotted with the scarcely prominent points of the cells.

51. *S. sentina*, cells minute, gregarious but distinct, immersed, globular, black, white internally; orifice exserted, subglobose. SPRENG. *Syst. Veg.* iv. 403. *S. grossularia*? Bot. Gall. ii. 709.

Hab. On the dead leaves of the blackberry and hawthorn, previous to their fall from the bushes, scattered over the whole inferior surface.

52. *S. Hederæ*, scattered, black, minute, semi-immersed, prominent, smooth, the centre depressed or concave and lighter coloured. SPRENG. *Syst. Veg.* iv. 403. *S. punctiformis*, var. *Hederæ*, PERS. *Syn.* 90. HOOK. *Scot.* ii. 8.

Hab. On dead ivy and oak leaves scattered over the whole surface, rare.

Though minute, this species is still considerably larger than *S. maculiformis* or *punctiformis*, and readily distinguished from both by its depressed and light centre. My specimens are placed on the under surface of the ivy, and on the upper surface of the oak leaves.

53. *S. empetri*, capsules immersed, minute, black, distant, few on a leaf, hemispherical, with an obscure papillary orifice. SPRENG. *Syst.* iv. 403.

Hab. On dead but still attached leaves of the crowberry.

54. *S. phaeomes*, capsules immersed, minute, black, white within, bearded with a pencil-like tuft of black rigid hairs. SPRENG. *Syst.* iv. 404. *Cryptosphæria capillata*, GREV. *Crypt. Fl.* t. 69; *Fl. Edin.* 362.

Hab. Parasite on the dead leaves of grasses in woods, frequent in this neighbourhood, and readily distinguished by the minute little tufts which it forms on the leaves.

55. *S. trichella*, capsules subimmersed, minute, scattered, black, ovate, depressed, the summit covered with diverging rigid hairs or bristles. *Vermicularia trichella*, GREV. *Crypt. Fl.* t. 345.

Hab. On dead ivy leaves, occasionally.

SPRENGEL makes this a variety of the preceding. I have seen the same or a nearly allied species on decayed leaves of *Vaccinium Myrtillus*.

56. *S. punctiformis*, capsules scattered, punctiform, black, smooth, globular, without a perceptible orifice. PERS. *Syn.* 90. HOOK. *Scot.* ii. 8.

Hab. On dead oak and sycamore leaves, in winter, abundant.

The capsules are just visible with the naked eye. They are very numerous, immersed in the cellular texture of the

decayed leaf, and confined to the under surface. On beech leaves I find a variety not visible without a magnifier, and apparently confined to the upper side of the leaf.

57. *S. lichenoides*, capsules very minute, black, immersed, prominent, clustered on dead spots of living leaves. DECAND. *Fl. Franc.* ii. 299. and vi. 147. *Xyloma lichenoides*, *Ibid.* ii. 304.

Hab. On leaves of trees and herbaceous plants in summer.

The leaves of some trees and herbs, even when in full vigour, may be observed to be marked occasionally with dead spots produced by an absorption of their parenchyma and colouring matter. On these spots we can often detect black dot-like Sphæriæ scattered in profusion, and to all such, I would, in this work, extend the name of *lichenoides*. Whether the parasite is the cause of the death of the part, as DECANDOLLE thinks, or whether the part, by its decay, has merely been brought into a state favourable for its development, is doubtful; but on the same tree I have found spotted leaves, some with and some without Sphæriæ,—a fact which tends to support the latter opinion. The following varieties have been observed in this neighbourhood :

a. Spots subcircular, brownish, bounded by a darker line; sphæriæ on the upper side. Leaves of the ash and ivy.

b. Spots subcircular or irregular, eaten, netted by the reticulation of the leaf; sphæriæ on the under side. Leaves of the maple.

c. Spots subcircular, brown, bounded by a slight thread-like line; sphæriæ on the upper side. Leaves of the common avens.

d. Spots circular, pale, surrounded by a purple halo; sphæriæ immersed, on the upper side. On the leaves of the common docks. (Probably a distinct species.)

e. Spots irregular, brown, limited by the reticulations of the leaf; sphæriæ very minute, on the under side. Leaves of the French willow.

SPRENGEL, in his *Systema Vegetabilium*, has described 360 species of this genus, and FRIES, a later author, is said to have made them upwards of 500. The fact affords a very striking illustration of that variety in his works which the

Creator of all has everywhere indulged in. All the Sphæriæ apparently serve the same end in the economy of nature, viz. of hastening the reduction of vegetable matter to its original dust; and that purpose, we may suppose, might have been effected as easily by an increase in the numbers of one, as by the creation of a multitude of species. It has, however, seemed good that it should be otherwise, and it is very probable that those little but permanent differences which characterize the species, are accompanied with variations in the operation of the plants, important in their results, although to us unapparent. In the present instance, we can scarcely look on this great variety as auxiliary to the beauty of earth's surface, for, with scarce an exception, the Sphæriæ are so diminutive as to require the practised eye of the botanist for their detection. He finds in the examination of their structure, a pleasing and agreeable spectacle, and so much curious design and constancy as are quite subversive of hypotheses implying spontaneous generations or formative powers of nature as necessary to account for their production. If I may judge from my own experience, it is, in fact, in these "minims of nature," that we are most strongly impressed with the conviction of the existence of a First Great Intelligent Cause; and are most ready to admit that his works are wonderful, and made in wisdom.

67. DOTHIDEA.

Obs.—In *Sphæria* the seminiferous pulp escapes without any laceration of the capsules, which often remain for a considerable time after they have emptied themselves of their contents. But in *Dothidea* the discharge of the pulp can only be effected by the destruction of the cells, which appear to have no natural aperture. The species are of a black colour, parasitic on leaves.

1. *D. Ulmi*, cells clustered; clusters scattered, subcircular, raised, black, the surface dotted or granular; interior black with white cells. GREV. *Crypt. Fl.* t. 200. f. 1. *Sphæria ulmaria*, Sow. *Fung.* t. 374. f. 3. *Sp. Ulmi*, Moug. and Nest. No. 766. *Stromatosphæria ulmaria*, GREV. *Fl. Edin.* 357.

Hab. On the upper side of dead elm leaves.

2. *D. Robertiani*, subgregarious, hemispherical, minute, smooth, glossy black, white within. GREV. *Crypt. Fl.* t. 146. f. 1. *Cryptosphæria nitida*, *Fl. Edin.* 363.

Hab. On the under surface of the living leaves of the stinking crane's-bill, in autumn.

The leaves of this herb continue green until winter has at least fairly set in, and in that season the under surface may be observed marked with excavated dots, which have no relation to this, or any other parasite. They are the remains of the ruptured glands containing the essential oil whence the plant derives its strong disagreeable odour; and that they are so, is easily proved by rubbing such leaves between the fingers, when they will be found perfectly scentless.

3. *D. alnea*, small, gregarious but distinct, glossy black, sub-circular, flattened, roughish. GREV. *Crypt. Fl.* t. 146. f. 2. *Xyloma alneum*, PERS. *Syn.* 108. MOUG. and NEST. No. 78. HOOK. *Scol.* ii. 9. GREV. *Fl. Edin.* 368.

Hab. On both surfaces of the living leaves of the alder, generally occupying a half or a smaller portion of it, but sometimes scattered over the whole.

4. *D. Heraclei*, rugose and somewhat tubercular, confluent, black, opaque; internally black with white cells. SPRENG. *Syst. Veg.* iv. 417.

Hab. On the under surface of the leaves of the common cow-parsnip, in autumn, not common.

5. *D. Alchemillæ*, "filaments very minute, extremely fine, branched; at length bearing subdistinct black tubercles; producing a pale spot on the leaf." *Asteroma Alchemillæ*, GREV. *Fl. Edin.* 369.

Hab. On living leaves of the lady's-mantle, frequent.

This, when mature, consists of black minute raised points, or very short lines, clustered on pale circular spots of the leaf, and external to the epidermis. The points are irregularly arranged, but they are most closely set in the centre, and assume altogether an obscure star-like form.

68. PHASCIDIUM.

1. *P. coronatum*, black, smooth, convex, the base circular, broad, the apex dimpled and margined: diameter 1 line. GREV. *Crypt.*

Fl. t. 52. Fl. Edin. 366. Peziza comitalis, Sow. *Fung. t. 118. Xyloma pezizoides*, PERS. *Syn. 105.*

Hab. On dead beech (and oak) leaves, in woods.

The above description is taken from the plant in a dried state, and on beech leaves, on which, according to PER-
 SOON, it is less perfect than when on the oak, and seldomer
 open. In this latter state it is a fungus of considerable
 beauty, and has been aptly compared to a coronet in mi-
 niature. The apex splits into a number of acute triangu-
 lar segments, which become elevated and slightly bent
 back, so as to expose the disk, which is of a pale yellow or
 yellowish-green colour.

2. *P. repandum*, black, minute, roundish, prominent, the disk
 concave, black, with a waved or irregularly-divided margin.
 SPRENG. *Syst. Veg. iv. 411. Xyloma herbarum*, DECAND. *Fl. Franc.*
vi. 161.

Hab. On the leaves and stems of the blue sherardia, in
 June, rare.

Like a minute tubercle on the leaves, each distinct and ge-
 nerally remote. When pressed between two plates of
 glass, and examined by the microscope, it appears to be
 entirely composed of erect straight pellucid filaments,
 which are presumed to be organs containing the proper
 seeds.

3. *P. Vaccinii*, glossy black, minute, round, convex, dimpled
 when close, opening with 4 segments, the disk smoky-black.
 SPRENG. *Syst. Veg. iv. 411.*

Hab. On decayed leaves of *Vaccinium Myrtillus*.

69. RHYTISMA.

Obs —It cannot have escaped the observation of any one, that
 the leaves of the plane or sycamore become, in the autumn, mark-
 ed with large circular spots of a black colour. These spots afford
 the most characteristic example of this genus. There are various
 other species which all infest leaves previous to their fall, but
 scarcely until they have shown some symptoms of decay.

1. *R. salicinum*, black, rugose, thick, forming a large irregular

raised spot; internally white. GREV. *Syn.* 19. *Xyloma salicinum*, PERS. *Syn.* 103. HOOK. *Scot.* ii. 9. GREV. *Fl. Edin.* 368. *Crypt. Fl.* t. 118. f. 2. *X. leucocreas*, MOUG. and NEST. No. 175.

Hab. On the upper side of the leaves of willows, viz. *Salix caprea*, *aurita* et *prostrata*, not uncommon.

On the latter willow the spots are glossy, bullate, and very like *Rhytisma Andromedæ*.

2. *R. acerinum*, black, rugose, in large circular raised spots; interior white. GREV. *Syn.* 19. *Xyloma acerinum*, PERS. *Syn.* 104. HOOK. *Scot.* ii. 9. GREV. *Fl. Edin.* 369. *Crypt. Fl.* t. 118. f. 1.

Hab. On the upper side of sycamore leaves in autumn.

The spots are often surrounded by a yellow halo. Dr GREVILLE considers *R. punctatum* of authors as merely an earlier state of this species. It is characterized by the spots being much smaller, and placed at a little distance from one another, thus forming an imperfect cluster.

70. HYSTERIUM.

Obs.—The Hysteria are solid, sessile, and of a black colour, readily recognised by their linear form furrowed down the middle. They closely resemble the fructification of the genus *Opegrapha*, and seem to differ from it principally by their want of a crust. They grow on decayed wood, bark, and leaves; and the differences between the species are commonly so slight, that one is tempted to believe these may arise merely from variations in the structure of their sites.

* On wood or bark.

1. *H. quercinum*, bursting through the bark, elongate, flexuose, somewhat ventricose, greyish-brown. PERS. *Syn.* 100. GREV. *Fl. Edin.* 366. MOUG. and NEST. No. 367.

Hab. On dead and rotted oak branches, which are much roughened by the irregular manner in which this species bursts the epidermis.

2. *H. lineare*, subimmersed, crowded, generally placed parallel, linear, straight or flexuose; the disk linear with tumid lips. GREV. *Crypt. Fl.* t. 167. f. 2.

Hab. On the dead portions of the wood of various trees.
Our specimens are on the stems of the dog-rose.

3. *H. Fraxini*, elliptical, subcortical, convex, tumid, black; cleft with obtuse smooth lips. PERS. *Syn.* 100. HOOK. *Scot.* ii. 8. GREV. *Crypt. Fl.* t. 72. *Fl. Edin.* 367.

Hab. On dead branches of the ash, produced under the epidermis, which becomes of a pale colour, and forms a spot generally of a circular form, and on which the Hysteria are arranged in a subconcentric manner.

4. *H. pulicare*, scattered, oblong, short, tumid, dull black, obscurely striate; cleft broad with obtuse lips. HOOK. *Scot.* ii. 8. GREV. *Fl. Edin.* 366. *Crypt. Fl.* t. 167.

Hab. On dead portions of various trees.

Our specimens are on dead branches of *Vaccinium Myrtillus*, a plant not heretofore enumerated amongst those liable to be infested with this Hysterium. It offers, however, no character which might entitle it to be considered a distinct species.

* * * *On leaves.*

5. *H. gramineum*, minute, linear-elliptical, black, mostly on the ribs of the leaf or culm. GREV. *Crypt. Fl.* t. 87. *Fl. Edin.* 367.

Hab. On the leaves and stems of grasses.

6. *H. pinastri*, elliptical, depressed, the margin plane, paler and often bounded by a black line, the centre slightly raised. PERS. *Syn.* xxviii. GREV. *Crypt. Fl.* t. 60. *Fl. Edin.* 367. HOOK. *Scot.* ii. 8.

Hab. Leaves of Scotch fir, very common.

7. *H. Juniperi*, elliptical, glossy black, somewhat plane, growing longitudinally on the leaf. GREV. *Fl. Edin.* 367. *Crypt. Fl.* t. 26.

Hab. On dead juniper leaves, not rare.

* * * *On cones.*

8. *H. conigenum*, minute, roundish or oval, black, bursting the

thin epidermis by a slit in the centre. PERS. *Syn.* 102. Moug. and NEST. No. 75.

Hab. On dead cones of Scotch fir, very common.

Confined to the upper and exposed part of the scales. Very often there is nothing visible, except numerous minute black points penetrating the epidermis; but some of our specimens have the character of an *Hysterium* more evidently than those given in the work of MOUGEOT and NESTLER. It is surely not distinct from *Sphæria strobilina*.

71. SCLEROTIUM.

OBS.—MR PURTON, in his *Midland Flora*, iii. 319, says that *Sclerotium durum* in habit and substance does not appear to differ from our *Rhytisma salicinum*,—an opinion which may provoke a smile from the professed Mycologist, but which I am inclined to think is not far from the truth. *Sclerotium* differs from *Rhytisma* scarcely in any thing but in form, and that may depend on differences in their place of growth.

1. *S. durum*, adnate, dull black, oblong or linear-oblong, prominent, substrate; internally white. PERS. *Syn.* 121. Hook. *Scot.* ii. 10. GREV. *Crypt. Fl.* t. 1. *Fl. Edin.* 462.

Hab. On the dead stalks of the potato, and of umbelliferous plants, in winter, common.

Originates beneath the epidermis, but soon becomes exposed. There is sometimes the appearance of a cleft down the middle, when the plant much resembles an *Hysterium*.

2. *S. semen*, very black, globular or nearly so, free, roughish or corrugated; internally white. PERS. *Syn.* 123. GREV. *Crypt. Fl.* t. 144. f. 2. *S. Brassicæ*, Sow. *Fung.* t. 393. f. 3.

Hab. On rotting potato stalks, and on the stalk of a thistle, late in autumn, not common.

Our specimens were like small peas, of a darker colour than those figured by Dr GREVILLE. The fungus, however, is said to be pale when young, assuming in its progress a reddish, and at length a black hue. It easily parts from its hold, and is apt to fall off in drying.

3. *S. pustula*, scattered, dull black or brown, roughish, round,

often dimpled in the centre, very hard, corneous within. SPRENG. *Syst. Veg.* iv. 522. *S. quercinum*, GREV. *Crypt Fl.* t. 77. *Fl. Edin.* 462.

Hab. On a skeleton leaf of the balsam poplar.

I prefer the name of DECANDOLLE and SPRENGEL to that of GREVILLE, as the latter would lead us to suppose that the species was confined to the leaves of the oak. I have only found it once, but there are many specimens on the leaf, all, however, of a smaller size than those figured in the work quoted. Diameter about a line.

4. *S. clavus*, dull black, elongate, cylindrical, generally a little curved; internally white. DECAND. *Fl Franc.* vi. 115.

Hab. Between the glumes of grasses, occupying the place of the grain.

Great doubts have been entertained relative to the nature of this production, but I think, with DECANDOLLE, that if the two preceding are allowed a place in the vegetable kingdom, this cannot with propriety be excluded. It has been detected in this neighbourhood on the sweet vernal-grass, the sweet floating-grass, and on the fiorin. When it attacks rye, which is peculiarly subject to the disease, the corn is said to be *spurred*; and this diseased grain is an active poison of a very peculiar kind. If gradually introduced into the system, as when mixed with the flour of rye-bread, it occasions a severe disease which has often prevailed epidemically in different territories on the continent. The affection produced differs much in different epidemics, and even in different cases of the same epidemic. Two distinct set of symptoms have been noticed; the one constituting a nervous disease, characterized by violent spasmodic convulsions; the other being a depraved state of the constitution which ends in that remarkable disorder known by the name of dry gangrene. The poison possesses other singular properties, and the physician availing himself of it, can produce effects in the human constitution such as he can produce by no other medicine yet discovered;—a fact of which my own experience has afforded sufficient evidence. For an interesting history of what is known relative to the spurred rye, the medical reader is referred to Dr CHRISTISON's learned and useful work on poisons.

5. *S. muscorum*, gregarious, spongy, rounded but very unequal

and sometimes lobed; colour orange-yellow. PERS. *Syn.* 120. *S. subterraneum*, GREV. *Fl. Edin.* 461. *Crypt. Fl.* t. 101.

Hab. Attached to the roots of mosses in deans. On *Hypnum striatum*, in Longridge Dean.

6. *S. pteridis*, "black, very minute, roundish or oval, numerous, depressed." GREV. *Fl. Edin.* 463. MOUG. and NEST. No. 673.

Hab. On the dead stems of ferns. On *Aspidium Filix-mas*, in shaded and moist situations.

72. XYLOMA.

1. *X. rubrum*, spots rather large, generally circular, even with the surface or raised, reddish-orange, dotted with black. PERS. *Syn.* 105. HOOK. *Scot.* ii. 9. *Polystigma rubrum*, GREV. *Fl. Edin.* 365. *Crypt. Fl.* t. 120.

Hab. On the leaves of the sloe in autumn.

The claims of this to be numbered amongst vegetables are slight, but not slighter than those of any other species in the genus. The acidity of the sap acting on the green parenchyma into which it has been effused, will account for the red colour; the dots or punctures on the surface are probably enlarged pores of the epidermis; and the unequal and irregular grains called sporules, are, by their very inequality, proved to be any thing rather than the seminal products of a proper vegetation.

2. *X. salignum*, spots small, roundish, black, almost even with the surface, many on a leaf.—PERS. *Syn.* 106. GREV. *Fl. Edin.* 368. MOUG. and NEST., No. 268. *Phoma salignum*, Bot. Gall. ii. 726.

Hab. On decayed leaves of *Salix caprea* and *aurita*, frequent.

The spots are about one-half line in diameter, and have a tendency to follow the nerves of the leaf in their arrangement.

3. *X. concavum*, spots numerous, small, circular or oblong, concave, bordered, black.—GREV. *Fl. Edin.* 368. *Sphæria concava*,

Sow. *Fung. t.* 317. *S. complanata*, MOUG. and NEST., No. 82. *Eustegia ilicis*, *Bot. Gall. ii.* 717.

Hab. On dead holly leaves.

At first the spots are level with the surface of the leaf, but the upper part separates, and they then become excavated.

4. *X. Geranii*, spots small, black, roundish, even with the surface or slightly raised, rough or granulated; interior black.—GREV. *Fl. Edin.* 368.

Hab. On the leaves of the wood crane's-bill.

5. *X. populinum*, spots small, thickened, clustered, roundish or angular and subconfluent, reddish-brown, becoming black.—*Bot. Gall. ii.* 875. *Sclerotium populneum*, GREV. *Fl. Edin.* 463.

Hab. On decaying leaves of poplars, common.

Xyloma populinum of GREVILLE is a different plant.

6. *X. salicinum*, spots thickened, scattered or clustered, roundish or angular, rugose, at first orange-coloured, becoming brown, and ultimately dark brown.—*Bot. Gall. ii.* 875. *Sclerotium salicinum*, GREV. *Fl. Edin.* 462.

Hab. On the leaves of *Salix caprea*, frequent.

Very distinct from *X. salignum*, and more evidently a diseased and thickened state of the leaf.

7. *X. Rosæ*, on branches, clustered, often confluent, compact, orbiculate, convex, greyish-black, covered by the epidermis, which is at last irregularly ruptured.—*Bot. Gall. ii.* 876.

Hab. On branches of the wild roses, the part affected being swollen and uneven.

8. *X. Spireæ*, spots irregular, effused, black, nearly smooth, slightly raised.—MOUG. and NEST., No. 760. *Leptostroma Spireæ*, *Bot. Gall. ii.* 726.

Hab. Generally on the dead stalks of the meadow-sweet, but my specimens are on one of the lesser *umbelliferae*.

In July and August, the upper surface of the leaves of the coltsfoot are often marked with large irregular spots of a reddish-brown colour, mapped with black excavated lines, which are irregularly branched and dilated at intervals. The spots are even with the surface,—a discoloration rather than a disease; but the lines have extended into the substance of the leaf, and are apparently of a parasitic nature. They are too regular in their appearance, and too curiously ramified, to be produced by mere decay or mortification; nor are they the work of insects, but as I cannot discover any decided traces of organization, I would not raise the thing to the rank of a vegetable, nor give it a name.

73. CEUTHOSPORA.

1. *C. phacidioides*, subcircular, plane, or slightly convex, glossy black, smooth, the apex bursting at length by 3–5 short pale segments; interior brown.—GREV. *Crypt. Fl.* t. 253. *Phascidium multivalve*, MOUG. and NEST., No. 560. *Sphæria bifrons*, Sow. *Fung.* t. 316. *Cryptosphæria bifrons*, GREV. *Fl. Edin.* 361.

Hab. On leaves of the holly, the spots visible on both sides at opposite points.

74. ERYSHIPHE.

OBS.—The *Erysiphe* grow upon living leaves. They form diffused pulverulent or cobweb-like spots on the surface by a tissue of fine appressed filaments, amid which a careful eye discovers minute sessile globules scattered in profusion. The filaments are of two kinds: the one, termed by Dr GREVILLE the radicular, are short, rigid, generally of a darker colour, and perhaps organically attached to the globules; the other are longer, white, and interwoven, and because they are produced previous to the appearance of the globules, are named the primary. The globules themselves are always at first of a yellowish-colour, becoming brown and ultimately black. They are filled with oval grains, which appear to be capsules, and each of which is said by DECANDOLLE to contain two seeds, but the number is frequently greater.

1. *E. communis*, base effused, areneous, whitish; radicular filaments simple, white, affixed to the base; globules spherical, scat-

tered, very numerous, ultimately blackish-brown.—*Bot. Gall.* ii. 869. LINK in WILD. vi. i. 105. *Alphitomorpha communis*, SPRENG. *Syst.* iv. 407.

- a. *Leguminosarum*. *E. Pisi*, GREV. *Fl. Edin.* 461.; *Crypt. Fl.* t. 134. *E. Lathyri*, *Fl. Edin.* 460. *E. Trifolii*, *ibid.* 459.
- b. *Umbelliferarum*. *E. Heraclei*, DECAND. *Fl. Franc.* vi. 107.
- c. *Cichoracearum*. *Bot. Gall.* ii. 869.

Hab. (a.) On the leaves of the garden pea, on wild vetches, and on trefoils. (b.) On the leaves of the cow-parsnip, frequent. (c.) On the dandelion.

2. *E. lamprocarpa*, base effused, with very short densely interwoven filaments; radicular filaments very long, tortuous, fuscous; globules glossy, ultimately dark brown.—*Bot. Gall.* ii. 869. LINK in WILD. vi. i. 108. *Alphitomorpha lamprocarpa*, SPRENG. *Syst.* iv. 408.

Hab. On both sides of the leaves of *Plantago lanceolata*. August.

The globules are larger than those of the preceding.

3. *E. compositarum*, base effused, with the filaments loosely interwoven; the radicular very tender, ultimately blackish-brown; globules very numerous, somewhat concave, margined.—*Bot. Gall.* ii. 870. *E. depressa*, LINK in WILD. vi. i. 110.

- a. *Lappæ*. *E. Arctii*, GREV. *Fl. Edin.* 460.
- b. *Artemisiæ*. *E. Artemisiæ*, GREV. *ibid.* 459.

Hab. (a.) On the leaves of burdock. (b.) On the mugwort.

4. *E. divaricata*, base effused, the filaments densely interwoven, greyish-white; radicular filaments bent upward, twisted, forked at the points, the branches divergent, the ultimate flobose; globules numerous, ultimately depressed and brown.—LINK in WILD. vi. i. 112. *Bot. Gall.* ii. 870. *Erysiphe lonicerae*, GREV. *Fl. Edin.* 461.

Hab. On the leaves of the honeysuckle.

5. *E. penicillata*, base effused, the filaments very fine, densely interwoven, greyish-white; radicular filaments straight, pencilled at the apex; globules minute, ultimately depressed and blackish.

brown.—LINK. *ut cit.* 113. *Bot. Gall.* ii. 871. *Erysiphe Berberidis*, GREV. *Fl. Edin.* 460.

Hab. On the leaves of the barberry.

6. *E. guttata*, radicular filaments straight or at length kneed, subulate, bulbous at the base; globules rather large, raised on a pale irregular spot.—LINK, *ut cit.* 116. *Bot. Gall.* ii. 871. *Er. coryli*, DECAND. *Fl. Franc.* ii. 272. *Sclerotium erysiphe*, var. β . PERS. *Syn.* 124.

Hab. On the under surface of the leaves of hazel, in autumn.

75. RHIZOMORPHA.

1. *R. divergens*, "cylindrical, somewhat flexuose, reddish, the branches always free, patent."—GREV. *Crypt. Fl.* t. 154.; *Fl. Edin.* 354.

Hab. Between the bark and the wood of decayed stumps of fir trees in Blackadder plantations.

2. *R. subcorticalis*, very long, brown, rugose; primary branches compressed, obscurely channelled beneath, subparallel, joined together by numerous parallel side branches.—GREV. *Fl. Edin.* 354. *R. fragilis*, *Bot. Gall.* ii. 867.

Hab. Between the bark and wood of much decayed trees, forming a very extensive coarse sort of network enveloping the trunk, not uncommon.

3. *R. setiformis*, irregularly branched, very slender and filiform, black, smooth; branches patent, tapered, free.—*Bot. Gall.* ii. 868.

Hab. Parasitic on dead leaves and twigs in woods.

Dr GREVILLE maintains that this is a barren and monstrous state of *Agaricus androsaceus*.

76. DACRYMYCES.

1. *D. deliquescens*, gregarious, small, rounded, convex, smooth, yellowish-orange.—*Bot. Gall.* ii. 729. *D. stillatus*, GREV. *Crypt.*

Fl. t. 159. *Tremella deliquescens*, WITH. iv. 86. GREV. *Fl. Edin.* 427.

Hab. On rotten wood, everywhere. Spring.

2. *D. Urticæ*, minute, oblong, rather plane, orange-coloured or red; filaments simple, slightly curved.—*Bot. Gall.* ii. 729. *Tremella Urticæ*, PERS. *Syn.* 628. *Fusarium tremelloides*, GREV. *Crypt. Fl. t.* 10.; *Fl. Edin.* 471.

Hab. On dead stems of the nettle, common in early spring.

77. ILLOSPORIUM.

1. *I. roseum*, scattered, roundish, or somewhat lobed, pinkish-red or rose-coloured.—GREV. *Syn.* 10. *Bot. Gall.* ii. 876. *Tubercularia rosea*, PERS. *Syn.* 114. *Palmella rosea*, GREV. *Crypt. Fl. t.* 51.; *Fl. Edin.* 323.

Hab. On *Borrera tenella*, frequent in autumn, and sometimes on the bark near lichens.

78. TREMELLA.

OBS.—Were the parenchymatous matter of *Sclerotium* less compact and solid, or were that of *Stilbospora* more abundant, we should have, I think, a *Tremella*. These fungi are of a soft gelatinous consistence, having the seminal grains immersed in the outer covering. The colour and forms of the species are variable, and dependent in some degree on the state of the atmosphere, for in dry weather they shrivel up and become obscure, while in moist weather they swell out remarkably, and assume colours generally of a vivid hue. They either sprout from under the bark of trees, or find a station fit for their development on rotten wood.

1. *T. mesenterica*, saffron-yellow, raised, much plaited, large.—WITH. iv. 86. *Eng. Bot. t.* 709. *Hook. Scot.* ii. 32. GREV. *Fl. Edin.* 426.

Hab. On dead branches of whin, broom, and hawthorn, in spring.

Springs from under the bark, and is readily distinguished by its fine colour and furbelowed surface.

2. *T. albida*, whitish or light vinous-brown, soft and gelatinous, in roundish, smooth, and somewhat lobed masses.—WITH. iv. 83. *Eng. Bot.* t. 2117. *Hook. Scot.* ii. 31. *GREV. Fl. Edin.* 427.

Hab. On stumps of rotten and moss-grown trees in deans, not uncommon.

The masses are about the size of a hazel-nut, semipellucid, and in drying almost entirely disappear.

3. *T. spiculosa*, blackish-green, effuse, plane, and rather thick, minutely papillary on both sides.—PERS. *Syn.* 624. *MOUG. and NEST., No.* 395. *Exidia glandulosa, Bot. Gall.* ii. 732.

Hab. On decaying branches, not common. Spring.

This originates under the bark, which it bursts through, and then spreads over the branch for an inch or two in oval patches, not adherent to the wood, but closely laid upon it. It is black, thin, and firm when dry, but in a moist and perfect state the colour is an olive-green, and the consistence gelatinous although tough. The surface is even or nearly so, covered on both sides with numerous small papillary tubercles or spiculæ. The interior is transparent and colourless. Botanists have usually quoted the *Tremella arborea* of the *Eng. Bot.* as synonymous with this species of PERSOON, but of the correctness of that I have some doubt, for our specimens, which are precisely similar to those in MOUGEOT and NESTLER's collection, agree neither with the figure nor description of the former. And, indeed, I am satisfied that at least one other species has been confounded with *T. arborea*, but I must leave the task of establishing it to some better mycologist.

4. *T. sarcoides*, erect, reddish-purple, at first club-shaped, then rounded, lobed, plaited or curled, finally blackish.—WITH. iv. 84. *Eng. Bot.* t. 2450. *Hook. Scot.* ii. 32. *GREV. Fl. Edin.* 427.

Hab. On rotten wood in damp woods, in winter and spring.

“ Its substance is semipellucid, gelatinous, with a toughish elastic skin; the colour a vinous or flesh-like purple, turning dull, and at last black, in decay.”—SMITH.

79. PODISOMA.

1. *P. clavariæformis*, gregarious, tooth-like, cylindrical or somewhat compressed, orange-yellow, smooth; granules elliptical, acute at each end.—*Bot. Gall.* ii. 881. *Tremella clavariæformis*. GREV. *Fl. Edin.* 427.

Hab. On the living branches of the juniper, in clusters, studding the affected branch for 2 or 3 inches with fungus-like spines pointing in every direction. Spring.

Simple, about $\frac{3}{8}$ ths in height, tapered, brownish at the tip, tough when dry, soft when moist. Each fungus is composed of an immense number of grains, which are large, bilocular, acute at each end, and often terminated by what seems to be a pellucid hair, but which is probably the gelatine so drawn out. Sometimes a number of the grains are united together in a moniliform series.

80. TUBERCULARIA.

OBS.—*Tubercularia* seems nearly allied to *Sclerotium*, but in the former, the granules, instead of being diffused through the whole mass, are confined to a layer superimposed on a fleshy base. The species are of a red colour, parasitical on decayed wood, which they spot with wart-like tubercles.

1. *T. vulgaris*, aurora-red, smoothish, subsessile.—HOOK. *Scot.*
 ii. 9. GREV. *Fl. Edin.* 463. *Tremella purpurea*, LIGHTF. *Scot.*
 901. *Sphæria tremelloides*, WITH. iv. 427. *Clavaria coccinea*,
 Sow. *Fung.* t. 294. DILL. *Musc.* t. 18. f. 6.

Hab. On decaying sticks, particularly on beech, common in autumn and winter.

Gregarious, studding the branches for a considerable space with scattered red rather small tubercles, which are soft but not gelatinous when moist, hard when dry. The tubercles are subglobular, raised on a very short thick base concealed by the ruptured bark, and internally of a reddish-brown colour.

2. *T. confluens*, gregarious, becoming confluent, depressed,

smooth, of an aurora-red colour with a mixture of pink, subsessile.—HOOK. *Scot.* ii. 9. GREV. *Fl. Edin.* 463.

Hab. On dead branches of the plane and ash trees, not uncommon in spring.

“Smaller than the preceding, and far more depressed; surface not rounded, but gently convex or quite plane, soft, becoming confluent and angular, often irregular from the union of one or more together.”—GREVILLE. Yet it is sometimes difficult to trace the limits between the species, nor do I think it would be injudicious to unite them under one name.

3. *T. granulata*, brownish-red, rough and tubercular, subsessile.—PERS. *Syn.* 113. GREV. *Crypt. Fl.* t. 187.

Hab. On dead branches of the sycamore, rare.

Diameter about a line; blackish when old.

81. CENANGIUM.

1. *C. Abietis*, gregarious, coriaceous, subsessile, rugose, and somewhat powdery, dull black, compressed; when moist spreading, the disk yellow.—Bot. *Gall.* ii. 736. *C. ferruginosum*, GREV. *Crypt. Fl.* t. 197. *Peziza Abietis*, Moug. and Nest., No. 399.

Hab. On dead branches of the Scotch fir, frequent.

82. PEZIZA.

Obs.—The genuine *Pezizæ* are shaped like a cup or saucer, and in the smooth concavity or disk the seeds are placed, whence they are discharged in the form of a fine powder. These seeds are contained in linear tubes, placed erect, and in close apposition, but it requires a good magnifier and a careful dissection to unfold this structure. It is a remarkably beautiful genus, but from the great number described the species are difficult to ascertain. Their consistence is in general soft and fleshy; they exhibit all colours, vary much in size, and while the greater number grow on decayed wood, some prefer the naked soil. Unable to identify some of the minute species, I have chosen, as I have done in other genera, rather to omit them from my list, than expose my-

self to the risk of describing under a new name that which is possibly already well known.

* *Sessile and smooth.*

1. *P. atrata*, scattered or gregarious, black, with a light coloured rim; cupped at first, becoming plane, often with a waved margin; diameter $\frac{1}{8}$ th.—PERS. *Syn.* 669.

Hab. On the stalks near the roots of thistles and ragweed common; and on decayed branches of the whin.

2. *P. immersa*, scattered or gregarious, black, concave, immersed in wood; diameter 1 line.—SOW. *Fung.* t. 369. f. 9.

Hab. On decayed gate-posts, much resembling the apothecia of a lichen.

3. *P. cartilaginea*, scattered, orange-red, fleshy; base convex, naked; disk concave, becoming convex, the margin circular, smooth; diameter sometimes $\frac{1}{4}$ th of an inch.—SOW. *Fung.* t. 369.

f. 2. *P. scutellata*, var. 2, WITH. iv. 388.

Hab. Clay banks, nidulating amongst moss. Autumn and winter.

Like *Pez. coccinea*, but generally smaller, less brilliantly coloured, becoming more uniformly convex, and always with a naked rim.

4. *P. nigra*, turbinate, firm, gelatinous, externally roughish, dull black; disk nearly plane, black, smooth.—MOUG. and NEST., No. 197. *Bulgaria inquinans*, LOUD. *Encyclop.*, No. 16280. *Bot. Gall.* ii. 738.

Hab. On the dead trunk of an old and rugged ash near Berwick.

In consistence this resembles a *Tremella*. The larger specimens are little less than an inch in diameter when moist and fully dilated.

* * *Sessile, rough, downy or hispid.*

5. *P. scutellata*, saucer-like, scarlet, edged with a fringe of black stiff hairs; base buff coloured, hirsute.—LIGHTF. *Scot.* 1053.

WITH. iv. 388. BOLT. *Fung.* t. 108. f. 1. Sow. *Fung.* t. 24.
 HOOK. *Scot.* ii. 33. GREV. *Fl. Edin.* 420. RAI, *Syn.* t. 24. f. 3.

Hab. On moist clay banks, but more commonly on old cow-dung.

I have frequently found this beautiful fungus half an inch in diameter, but it is generally smaller.

6. *P. pulchella*, gregarious, small, saucer-shaped; externally white or cream coloured, tomentose; disk saffron yellow.—HOOK. *Scot.* ii. 33. GREV. *Fl. Edin.* 421. *P. bicolor*, Sow. *Fung.* t. 17.

Hab. On larch twigs in Blackadder plantations, and elsewhere, plentiful.

Our specimens were fully $\frac{1}{8}$ th in diameter. At first cupped with an involute border.

7. *P. albo-violascens*, scattered, cupped; externally snow-white, tomentose, with a thick inflexed, sometimes waved margin; disk glaucous black.—SPRENG. *Syst. Veg.* iv. 504.

Hab. On dead twigs of whin in autumn.

Like the preceding in shape and size; diameter $\frac{1}{8}$ th. On keeping the specimens a few days in a closed box, the disk became of a grey colour.

8. *P. granuliformis*, gregarious, cupped, snow-white, tomentose, the mouth contracted; diameter $\frac{1}{2}$ line.—PERS. *Syn.* 651. GREV. *Fl. Edin.* 421. *P. sessilis*, Sow. *Fung.* t. 389. f. 1.

Hab. On decayed stalks of large herbaceous plants in autumn, abundant.

9. *P. nidulus*, minute, sessile, brown, crucible-like, rough externally; margin of the aperture circular, plane, not contracted.—GREV. *Fl. Edin.* 420.

Hab. On the stems of the cow-parsnip in autumn, abundant; but not to be distinguished except by the practised eye of the botanist.

I have doubts whether this is the *P. nidulus* of foreign botanists.

10. *P. clandestina*, gregarious, minute, subsessile, turbinate, beautifully and deeply cupped, of a uniform yellowish-brown

colour, externally very pubescent and rough; aperture circular, close when dry.—*Bot. Gall.* ii. 746.

Hab. On decayed and decorticated branches of a willow in Longridge Dean. Spring.

This pretty species grows densely clustered, and opens only in moist weather. When the aperture is closed, the plant so closely resembles the *Trichia faginea* hereafter described, that it is difficult to point out a difference. Height $\frac{1}{2}$ line; summit pale.

11. *P. hydnoides*, gregarious, minute, globular, externally densely pubescent, yellowish green; aperture circular, contracted; disk black.—*Sow. Fung.* t. 178.

Hab. On decayed stumps of trees in the dean at the Pease-bridge. Autumn.

A minute but remarkably neat species, resembling an *Echinus* in miniature.

12. *P. plumbea*, gregarious, minute, subglobular or cupped, externally villose, brownish-olive; disk bluish-grey; diameter 1 line.—*GREV. Crypt. Fl.* t. 11.

Hab. On decayed wood in moist places, rare.

*** *Stalked and smooth.*

13. *P. faginea*, small, milk white; stalk short; head circular, plane or slightly convex, with an even margin.—*PERS. Syn.* 664.

Hab. On decayed twigs and straws in damp woods, plentiful in autumn.

The stalk is scarcely a line long, rather thick; the disk abrupt, $\frac{1}{8}$ th in diameter, never cupped, fleshy. Allied to *P. fructigena*, but perfectly distinct.

14. *P. citrina*, gregarious, small, yellow; stalk very short, thickish; head circular, slightly cupped, becoming plane, with an even or obscurely waved margin.—*PERS. Syn.* 663. *GREV. Fl. Edin.* 424. *P. aurea*, *Sow. Fung.* t. 150.

Hab. On the sawn stumps of trees in woods, abundant in autumn.

The very young plants are deeply cupped, and of a watery-white colour. The mature plants are fleshy and thickish.

14. *P. campanula*, gregarious, small, of an uniform cream colour; pileus thin and membranous, with a plane not contracted margin. Diameter 1 or 2 lines.—GREV. *Fl. Edin.* 423.

Hab. On the stalks of decaying herbaceous plants in autumn.

15. *P. pallescens*, scattered, minute, of a uniform very pale yellow, fleshy; the stalk dilated into a cupped pileus, the margin contracted and even.—PERS. *Syn.* 664. *P. pedicillata*? Sow. *Fung.* t. 369. f. 4.

Hab. On twigs and grasses in a state of decay, common in autumn.

About $\frac{1}{8}$ th in height. The stalk is rather thick, and seems to dilate gradually into a deeply cupped head; the aperture contracted. In this respect it differs from *P. campanula*, the mouth of which is described as “widely open.”

16. *P. æruginosa*, “verdigris-green, turbinate, at length, spreading, somewhat flexuose; the stipes short.”—GREV. *Crypt. Fl.* t. 241.

Hab. On rotten wood. Communicated from the neighbourhood of Wooler, by Mr Mitchell, R. N.

“The remarkable property which this plant possesses, of staining the wood upon which it grows to the depth of two inches, constitutes a character by which it is distinguished from all other *Pezizæ*.” In other respects it is very variable, and the fungus rarely comes to perfection.

17. *P. ochroleuca*, “rather large, ochrey-brown, infundibuliform, at length concavo-repand or very plane; stipes elongated, dark at the base.”—GREV. *Fl. Edin.* 422. Sow. *Fung.* t. 115.

Hab. On decayed branches at Houndswood, plentiful. Aut.

A very variable species. The small plants are funnel-shaped, or they may be compared to the cups of the acorn; the outside yellowish-brown, the disk of a dark or umber colour. In its progress the disk becomes expanded and uneven; the colour is either a uniform yellowish-brown, or it is darker above than below. The length of the stalk is equally variable, sometimes more than half an inch, and

sometimes so short as almost to appear sessile. Diameter not uncommonly $\frac{3}{4}$ ths of an inch.

**** *Stalked, externally rough, downy or hispid.*

18. *P. virginea*, gregarious, snow-white; stalk thickish, short, pileus woolly, cupped, the margin inflexed; disk white. GREV. *Fl. Edin.* 421. HOOK. *Scot.* ii. 33. *P. nivea*, Sow. *Fung.* t. 65.

Hab. On decayed sticks in woods. Aut.

The diameter of the pileus is generally about 1 line, sometimes more; it is always concave and at first deeply cupped.

19. *P. coccinea*, funnel or cup shaped, tawny on the outside and cottony, the disk a fine carmine; margin smooth.—WITH. iv. 383. BOLT. *Fung.* t. 104. GREV. *Fl. Edin.* 421. *Crypt. Fl.* t. 171. *P. cyathoides*, LIGHTF. *Scot.* 1052. *P. epidendra*, Sow. *Fung.* t. 13.

Hab. In damp woods on decaying branches. Pease-bridge Dean. Spring.

In general about 1 inch in height, and of the same diameter. It excels every other fungus I have seen in brilliancy and beauty of colouring; and appears at a season when there is nothing to mar the effect produced by the contrast of its scarlet cup with the dark green of the surrounding moss, or the blackness of the stick on which it grows. It loves the cool recesses of the woods, and notwithstanding its exceeding beauty, has probably passed unnoticed by all save by the botanist.

“ The beauties of the wilderness are his,
That makes so gay the solitary place;
Where no eye sees them.”

83. TYPHULA.

1. *T. erythropus*, tuber reddish-brown, smooth; stalk filiform, reddish-brown, slender, erect, smooth, terminated with a linear white thickened apex or club.—GREV. *Syn.* 25. *Phacorrhiza erythropus*, GREV. *Crypt. Fl.* t. 43. *Fl. Edin.* 415. *Clavaria erythropus*, PERS. *Syn.* 606.

Hab. On sticks and straws in damp woods. Aut.

The tuberous root is generally concealed under the bark or within the straw, and so closely resembles the seed of some plant, that one can hardly believe it otherwise than one germinating in this peculiar situation, particularly when the fungus is young and has not developed its clubbed hymenium.

84. CLAVARIA.

Obs.—The *Clavariæ* are fleshy homogeneous fungi, growing always on the ground, and coming forth principally towards the end of autumn. They are undivided or branched, the apices tapered or club-shaped, but terminated by no cap or pileus distinguishable from the stalk. The seminal powder is enclosed in pellucid tubes, and at maturity is discharged from the whole surface, or from the upper part of it.

* *Simple.*

1. *C. ophioglossoides*, entirely black, club-shaped, the stalk sub-cylindrical, downy; height 1-2 inches.—WITH. iv. 400. BOLT. *Fung.* t. 111. f. 2. Sow. *Fung.* t. 83. *Geoglossum hirsutum*, HOOK. *Scot.* ii. 30. GREV. *Fl. Edin.* 416. *Crypt. Fl.* t. 185.

Hab. Moorish pastures, abundant.

2. *C. inæqualis*, yellow, smooth, subcylindrical or compressed, the apex tapered, bifurcate, or deformed. GREV. *Fl. Edin.* 414. *C. vermiculata*, LIGHTF. *Scot.* 1057. Sow. *Fung.* t. 253. HOOK. *Scot.* ii. 30.

Hab. Moorish pastures, abundant, solitary or in tufts.

1½ or 2 inches high, solid, fibrous, rather brittle, often furrowed and variously deformed. It is sometimes whitish, except about the summits.

3. *C. vermicularis*, white, smooth, cylindrical or compressed, the apex tapered, obtuse or obscurely bifid. GREV. *Fl. Edin.* 414.

Hab. Moorish pastures, either singly or 2 or 3 together. Oct.

Height 1½ inch. Substance fibrous, not fragile, with a spongy fistular centre.

4. *C. rugosa*, white, rugose or uneven, thickened upwards, simple or somewhat divided.—GREV. *Fl. Edin.* 413. GREV. *Crypt. Fl.* t. 328. *C. elegans*, BOLT. *Fung.* t. 115. *C. coralloides*, Sow. *Fung.* t. 278, lower figures.

Hab. Shaded woods. Blackadder plantations, abundant.

Gregarious or solitary, from 1 to 4 inches high, solid. "The taste is agreeable, resembling that of the common mushroom."—SOWERBY.

* * *Branched.*

5. *C. pratensis*, yellow, much branched; branches dichotomous, crowded, fastigate, with obtuse simple or bifid apices: height 1 or 1½ inch.—GREV. *Fl. Edin.* 412. *C. fastigiata*, LIGHTF. *Scot.* 1061. HOOK. *Scot.* ii. 29. WITH. iv. 402. RAIL, *Syn.* t. 24. f. 5.

Hab. Mossy pastures in autumn, common.

6. *C. coralloides*, white, erect; stipes thick; branches elongated, irregular, unequal, mostly acute.—GREV. *Fl. Edin.* 412. Sow. *Fung.* t. 278, upper fig. HOOK. *Scot.* ii. 29.

Hab. Thickly wooded deans in autumn, not common.

7. *C. cristata*, white or cinereous, tufted, branched, smooth; branches dilated at the summit and jagged, or shortly but acutely lacinate: 1–2 inches high; polymorphous.—GREV. *Fl. Edin.* 413. *Crypt. Fl.* t. 190.

Hab. Mossy pastures. On the Lammermuirs above Langton.

85. LEOTIA.

1. *L. lubrica*, stalk cylindrical, slightly tapered upwards, viscid, rough, yellow, crowned with an irregularly lobed olivaceous smooth cap. GREV. *Crypt. Fl.* t. 56. *Fl. Edin.* 417. *Helvella gelatinosa*, WITH. iv. 374. Sow. *Fung.* t. 70.

Hab. In woods, either solitary or in small tufts. Blackadder plantations. Plantation front of Scot's-Spittal-house. Aut.

The stalk is as thick as a goose-quill, and occasionally 3 inches in height. The outer coat is gelatinous, and can be

readily removed from the more firm and fibrous substance beneath. The centre is pulpy, but the pulp is firm and transparent. The cap is about an inch in diameter, covered beneath with a continuation of the gelatinous and rough coat of the stem; and in this part of it the seeds appear to be lodged.

86. MORCHELLA.

1. *M. esculenta*, stalk thick, hollow, dilated at the base; pileus egg-shaped, cellular like honeycomb, its base united with the stalk. HOOK. Scot. ii. 31. GREV. Wern. Mem. iv. 378. Crypt. Fl. t. 68. Fl. Edin. 417. *Phallus esculentus*, LIGHTF. Scot. 1043. WITH. iv. 393. *Helvella esculenta*, Sow. Fung. t. 51, excluding the two middle figures.

Hab. Sides of woods on a sandy soil, rare. Sides of the Whiteadder opposite Edrington-mill.

This "is well known by the name of *Morel*, and much esteemed as an ingredient in sauces and soups, for which purpose it may be preserved dried for many months, or even years. The people employed in gathering morels in Germany, having observed that they grew most plentifully where wood had been burned, proceeded to promote their propagation by setting fire to the woods, till it was found necessary to forbid that practice by law."—SOWERBY.

87. PHALLUS.

1. *P. foetidus*, wrapper egg-shaped; stem white, full of small cavities; pileus cellular, covered with a green mucous deciduous substance.—Sow. Fung. t. 329. HOOK. Scot. ii. 18. GREV. Fl. Edin. 418. Crypt. Fl. t. 213 and 214. *Ph. impudicus*, WITH. iv. 394. LIGHTF. Scot. 1044. BOLT. Fung. t. 92.

Hab. Sides of woods in a sandy soil. Woods at Netherbyres; and at Drygrange, Berwickshire, Rev. A. Baird. Aut.

At its first appearance this strange fungus resembles an egg in shape and colour. In this state it remains a few days, when it bursts the wrapper with violence, and "pushes up with amazing rapidity, attaining the height of 4 or 5 inches in a few hours." To explain this wonderfully rapid elongation, it is worth while, says Dr GREVILLE, "to remark,

that, while the stipes is confined within the volva, the cellules which occupy the greater part of its substance, are so much vertically compressed as to resemble crowded horizontal short lines; on the other hand, when it is mature, the cellules are roundish. It is probable, therefore, that the mere vertical dilatation of so many compressed cavities greatly facilitates this phenomenon." Previous to its eruption from the volva, the fungus was scentless, but now it diffuses all round a strong and peculiarly offensive smell, proceeding from the green slimy matter which fills the cells of the pileus. Flies are so fond of this offensive matter, that they crowd to the plant and devour it. The smell, it is remarkable, is less offensive when the Phallus is held near the nose than when at a distance. The white part of the stalk may be eaten, and is rather agreeable than otherwise.

88. BOLETUS.

1. *B. luteus*, stalk solid, cylindrical, with a veil or ring; pileus convex, yellowish, slimy, the margin circular; tubes yellow, with small circular orifices.—WITH. iv. 352. BOLT. *Fung.* t. 84. Sow. *Fung.* t. 265. HOOK. *Scot.* ii. 27. GREV. *Fl. Edin.* 403. *Crypt. Fl.* t. 183.

Hab. Woods and hedge bottoms, common. Aut.

I have seen a specimen of this species with a stalk thicker than a man's wrist, and a pileus a foot in diameter; but it is seldom larger than the common mushroom.

2. *B. subtomentosus*, stalk solid, smooth, yellow, streaked with red; pileus convex, brown, velvety, dry, the margin circular; tubes yellow with large angular pores.—GREV. *Fl. Edin.* 404.

Hab. Woods. Blackadder plantations. Aug.

3. *B. luridus*, stalk bulbous, thick, reticulated, red; pileus very convex, olivaceous, smoothish; flesh very thick, changing, when cut, to blue; tubes round, yellow, with red orifices. GREV. *Fl. Edin.* 404. *Crypt. Fl.* t. 121. *B. rubeolarius*, WITH. iv. 350. Sow. *Fung.* t. 250. *B. bovinus*, BOLT. *Fung.* t. 85.

Hab. Plantations. In a fir plantation near Longformacus.

4. *B. scaber*, stalk tapered upwards, thick, white, rough with a

black scurfiness; pileus convex, smooth, yellowish-brown; tubes reddish-white, long, with small angular orifices; flesh white.—GREV. *Fl. Edin.* 405. Sow. *Fung.* t. 175, indifferent. *B. aurantiacus*, Sow. *Fung.* t. 110, better. WITH. iv. 346. Hook. *Scot.* ii. 26.

Hab. Woods and plantations, frequent.

B. luridus is reported to be poisonous, and its aspect favours the report; nor, indeed, do any of our species tempt us by their appearance to try them as food. *B. scaber*, however, is used extensively in various countries; and Mr SOWERBY was told that it was a favourite food among the Russians and Poles, who have many ways of cooking and pickling it.

39. POLYPORUS.

Obs.—Long confounded with the preceding genus, yet remarkably distinct and well characterised. In *Polyporus* the hymenium, or porous surface, is formed of the same substance as the rest of the pileus, and the pores are divided by a simple dissepiment from each other, so that they are strictly perforations. In *Boletus*, on the contrary, the hymenium is capable of being separated entire from the pileus, and is moreover composed of perfect tubes, attached to each other, but capable of individual separation. The *Polypori* are mostly long-lived; the *Boleti* decay rapidly. The first are mostly sessile and dimidiate, and of a coriaceous substance; the second are always furnished with a central stalk, and are soft and juicy. GREVILLE.

* *With a more or less distinct stalk.*

1. *P. varius*, pileus rigid, glabrous, smooth; pores small, roundish, pale; stipes short, smooth, pale, becoming suddenly black at the base.—GREV. *Fl. Edin.* 399. *Crypt. Fl.* t. 202. *Boletus lateralis*, Hook. *Scot.* ii. 27. *B. nummularius*, WITH. iv. 350. Sow. *Fung.* t. 89.

Hab. On the decaying stump of a willow in Allerton-mill dean.

The two smallest figures in SOWERBY's plate precisely resemble our specimens; but as the plant is remarkably va-

riable, an attention to the specific characters is better than a longer description.

2. *P. squamosus*, large; pileus fleshy, of a somewhat ochraceous colour, more or less scaly; pores whitish; stalk sublateral, thick and swelling.—GREV. *Fl. Edin.* 399. *Crypt. Fl.* t. 207. *Boletus squamosus*, WITH. iv. 357. Sow. *Fung.* t. 266. HOOK. *Scot.* ii. 27. *B. cellulosus*, LIGHTF. *Scot.* 1032.

Hab. On the stumps of the ash, common.

Stalk lateral, short, thick, solid, firm. Pileus flattened, frequently 9 inches or more across, light brown with darker scales arranged concentrically; flesh white, tough, juicy, the fluid colourless. Under surface white, uniform, honey-combed with small quadrangular or pentangular cells. Probably unwholesome. It will grow from the same stump for many successive years, one plant occasionally piled above another like the combs in a hive, and is in greatest perfection about midsummer. Mr HOPKIRK mentions a specimen which, in 1810, attained an extraordinary size, being 7 feet 5 inches in circumference, and weighing, after having been cut four days, 34 lb. avoirdupois. It was only four weeks in attaining the above size, gaining thus an acquisition of weight of above one pound three ounces in the day!

* * *Perfectly sessile.*

3. *P. igniarius*, tubes green-grey or reddish-brown, pores very fine; pileus hard, thick, shaped like a horse's hoof, smooth, brown, waved.—GREV. *Fl. Edin.* 401. *Boletus igniarius*, LIGHTF. *Scot.* 1034. WITH. iv. 367. BOLT. *Fung.* t. 80. Sow. *Fung.* t. 132.

Hab. On the trunks of old ash trees, enduring for years; frequent in Berwickshire.

This attains a large size, and, when old, resembles a piece of old honeycomb attached to the tree. The pileus is often a shapeless mass, but more commonly it is semicircular or hoof-shaped, 2 or 3 inches thick, and from 6 to 9 in its longest diameter. If aged, the colour is a uniform dark brown, and the texture is firm, dry, and woody, with pores an inch long, and which are separable from one another as well as from the pileus; but in a young state, the hymenium is yellowish, the tubes are short with pubescent orifices, and the upper surface is covered with a close velvet-like shag.

The edge is always rounded and obtuse. The flesh is fibrous, cutting with some difficulty, but tearing readily in the direction of the fibres,—of a rich yellow, becoming quickly brown on exposure to the air. A watery fluid oozes from it on pressure, and this liquid (which is probably rain-water tinged by the colouring matter of the fungus) often stands in large drops on the surface. Steeped in water, the fluid acquires the colour of white wine, which is not affected by the addition of sulphate of iron, but rendered lighter by the diluted sulphuric acid, and considerably darkened by the carbonate of soda.

4. *P. fomentarius*, dimidiate, hard; pileus subtriquetrous, obsoletely banded, cinereous-brown; pores at first whitish, glaucous, afterwards subferruginous.—GREV. *Fl. Edin.* 400. *Boletus fomentarius*, Sow. *Fung. t.* 133. Hook. *Scot.* ii. 28.

Hab. On branches of trees, rare.

This is a much rarer fungus in Berwickshire than the preceding, for I have once only met with it. My specimens are on a decayed piece of ash, and were picked up in the plantations about the Retreat. They are, when dried, of a yellowish-brown colour, and the substance is spongy and rather soft, by which character it is, perhaps, best distinguished from the *igniarius*. The Amadou, celebrated as a styptic, and once much used in the practice of surgery, is prepared from this species, by removing the epidermis and porous parts, and beating the rest into a soft spongy state. Banished from surgery, the preparation now renders good service to the housewife and smoker, for all over the continent, and likewise in the Highlands of Scotland, it is used instead of tinder; and no German who smokes, stirs without his amadou, flint and steel.

5. *P. medulla-panis*, irregular, imbricate, above brown, uneven and rough; tubes straight or oblique, pure white, with small, angular orifices.—GREV. *Fl. Edin.* 402. *Boletus obliquus*, PURT. *Mid. Fl.* iii. 246.

Hab. At the roots of trees in woods, and in hedge bottoms, common.

Forms hard, corky, irregular and thick masses, always growing from decayed wood, and in the progress of its growth enveloping and fixing in its thickness, leaves, straw, and similar bodies. The thickness is increased by a peculiar

mode of growth,—one layer of pores being added or spread over another for perhaps three or four successive times. It is sometimes entirely white, but commonly the pileus is a dark brown, and the porous surface white, in drying sometimes acquiring a yellowish-brown tinge. I have felt considerable difficulty in assigning this fungus a name, but that which I have fixed upon is apt and expressive of its appearance. The figure which gives the best notion of it is that of the *Dædalea albida* in Mr PURTON's *Midland Flora*, tab. 33: and that experienced botanist suspects his *Dædalea* may be a variety of *Boletus obliquus*, our *P. medulla-panis*.

6. *P. versicolor*, imbricate, fan-shaped, plane, the margin thin and acute, upper surface velvety, circularly zoned; tubes white, short, with small round orifices.—GREV. *Fl. Edin.* 402. *Boletus versicolor*, WITH. iv. 362. LIGHTF. *Scot.* 1036. SOW. *Fung.* t. 229. HOOK. *Scot.* ii. 27.

Hab. On decaying trunks of trees, common.

A beautiful species, ornamented on the upper side with zones of purple, green, olive, and dull yellow or white. The purple zones are often iridescent, and the green ones are velvety, while the others are smooth.

7. *P. abietinus*, effused, at length mostly reflexed, thinish, coriaceous; upper surface wrinkled, whitish; pores purple, brownish when old, short, lacerating.—GREV. *Fl. Edin.* 402. *Boletus abietinus*, PURT. *Mid. Fl.* iii. 242. t. 13.

Hab. On the fallen and decaying trunks of firs, frequent.

8. *P. vulgaris*, “broadly effused, thin, dry, smooth, white; pores minute, subequal.”—GREV. *Fl. Edin.* 403.

Hab. On decaying wood, frequent.

A white coriaceous fungus growing on decaying wood, in patches of an oval or lengthened form, and sometimes several inches in extent. The margin is finely villous.

90. AURICULARIA.

Obs.—“These plants, when young, lie flat, and are closely attached to the substance on which they grow, the upper surface being smooth, but the under surface shaggy, with hairs which

serve the purpose of radical fibres. After some time the attachment formed by those fibres loosens, and the plant turns up more or less, but remains still attached in some one part, either central or lateral. The smooth upper side is now become the under one; and from this the seeds are discharged. The fibrous surface, now uppermost, continues shaggy or woolly, often becomes streaked or zoned in concentric stripes, and frequently assumes a variety of colours."—WITHERING.

1. *A. reflexa*, coriaceous, thin, yellowish, zoned; upper surface smooth, even; beneath villous or shaggy, zoned.—WITHER. iv. 378. Sow. *Fung.* t. 27. GREV. *Crypt. Fl.* t. 256. *Thelephora hirsuta*, HOOK. *Scot.* ii. 29. GREV. *Fl. Edin.* 407.

Hab. On decayed wood, very common; either irregularly effused or in circular pieces, and always shewing a tendency to assume the circular form.

2. *A. ferruginea*, imbricated, hard, woody, somewhat zoned; reddish-brown, smooth; upper surface papillose, minutely velvety, rust-brown, paler at the margin.—WITHER. iv. 376. Sow. *Fung.* t. 26. *Thelephora rubiginosa*, HOOK. *Scot.* ii. 29. GREV. *Fl. Edin.* 408.

Hab. On decaying trunks of trees, not common.

3. *A. corylea*, effused, adnate, thickish, the margin slightly reflexed; upper surface ochre-yellow, cracked in irregular squares, smooth, unequally papillose; beneath pubescent. *Thelephora corylea*, GREV. *Fl. Edin.* 408.

Hab. On decaying and dead hazel trees. Sent from the neighbourhood of Wooler by James Mitchell, Esq. R. N.

4. *A. corticalis*, effused, adnate, thin, somewhat brittle; upper surface flesh-coloured, unequally papillose, at length cracking; beneath blackish and smooth.—WITHER. iv. 377. *Thelephora quercina*, GREV. *Fl. Edin.* 409; *Crypt. Fl.* t. 142.

Hab. On dead branches of oak. Houndswood.

The same or a nearly allied species is very common on dead branches of the whin and broom.

91. HYDNUM.

1. *H. repandum*, stalk white, scarcely central; pileus fleshy, smooth, waved, yellowish; prickles unequal, pale yellow.—WITH. iv. 370. LIGHTF. *Scot.* 1041. Sow. *Fung.* t. 176. HOOK. *Scot.* ii. 28. GREV. *Wern. Mem.* iv. 374; *Crypt. Fl.* t. 44; *Fl. Edin.* 405.

Hab. Plantations. Blackadder plantations. Aut.

Stalk short, thick, white, solid, seldom quite central. Pileus suborbicular, often upwards of 6 inches in diameter, flat-tish, but waved and frequently lobed, smooth; flesh thick, white, not juicy. Prickles half an inch long, close, somewhat compressed, slanting, easily separated from the pileus. Edible and eaten on the Continent, but, in the words of Gerarde, "I giue my aduice vnto those that loue such strange and new-fangled meates, to beware of licking honey among thornes, lest the sweetness of the one do not counteruaile the sharpnesse and pricking of the other."

2. *H. auriscalpium*, stem erect, lateral, brown, pubescent; pileus fixed by the side, subcircular, brown, pubescent; teeth of the hymenium subulate, distant, whitish.—LIGHTF. *Scot.* 1042. WITH. iv. 369. BOLT. *Fung.* t. 90. Sow. *Fung.* t. 267. HOOK. *Scot.* ii. 28. GREV. *Fl. Edin.* 406; *Crypt. Fl.* t. 196.

Hab. Parasitical on decaying cones in Blackadder plantations.

The stalk and pileus become black in age, and the prickles of a purplish-blue colour. The root is firmly fixed to the scales of the cone, and springs from under the epidermis. The whole plant is firm and tough; and if not a beautiful, is certainly one of the most singular productions in the class.

92. AGARICUS.

Obs.—The mushroom is a familiar example of this genus. The species have, in general, a stalk composed apparently of longitudinal fibres placed parallel to one another, and in close apposition. The existence of vessels in the stalk has been denied, but their presence, according to Dr A. T. THOMSON, is demonstrable by placing a small transverse slice under a powerful microscope.

“They are not,” he says, “so readily distinguished in a longitudinal slice, a circumstance which I am inclined to ascribe to the transparency of their coats confounding them with the cellular substance in which they are imbedded; and which consists of continuous oblong cells, the membrane forming the sides of which is of very different degrees of thickness; but, nevertheless, they may be made out by any one accustomed to the use of the microscope.” Of the nature of these vessels, Dr THOMSON could not satisfy himself. They are neither the spiral, nor the annular, but he suspects them to be the moniliform. The stalk supports, or, more properly, is expanded into a circular cap or *pileus*, more or less convex on the upper surface, and furnished beneath with gills or lamellar folds radiating from the insertion of the stalk to the circumference. These gills are formed by a duplicature of the epidermis; and from them the seminal powder is discharged in great profusion. In the early state of the mushroom, the gills are completely covered by a membrane stretched, like a curtain, across the concave surface. It is torn by the growth of the fungus, and either disappears entirely, or hangs round the stalk like a collar, or leaves merely a stain indicative of its former existence.

* *Stalk central and solid.*

† *Gills decurrent.*

1. *A. eburneus*, white; stalk straight or somewhat curved, slightly tapered at the root; pileus smooth, convex, at length plane or cupped; gills decurrent, wide, not numerous.—WITH. iv. 185. GREV. *Wern. Mem.* iv. 360; *Fl. Edin.* 371; *Ag. virginus*, Sow. *Fung.* t. 32. GREV. *Crypt. Fl.* t. 166.

Hab. Old short pastures, in autumn, common.

This agaric is of a uniform ivory-white colour, “in damp weather rather viscid, and in wet seasons semitransparent.” Stalk 1 or $1\frac{1}{2}$ inch, slightly thickened upwards, solid, often curved. Pileus about an inch in diameter, convex, obtuse, at length plane or concave; flesh thin. Gills broad, 4 in a set, distant, decurrent. Edible.

2. *A. cyathiformis*, “gills greyish-white; pileus stone colour, very thin, soft, smooth, and leathery, glass-shaped; stem the

colour of the pileus, thickening upwards."—PURT. *Mid. Fl.* iii. 182.

Hab. Old pastures, not rare in autumn.

The stalk is tapered a little at the base, rarely so thick as a goose-quill, and from $1\frac{1}{2}$ to 2 inches high. The pileus is about the same in diameter, always smooth, of an uniform greyish mouse colour, and deeply cupped or funnel-shaped, with an even circular margin.

3. *A. pratensis*, stalk thickened upwards, smooth, whitish; pileus convex, umbonate, smooth, dull reddish-orange; gills thick, distant.—GREV. *Fl. Edin.* 376.; *Crypt. Fl.* t. 91.

Hab. Heathy pastures, in autumn, common.

Of a firm compact fleshy substance, the stalk thickish, and rarely more than $1\frac{1}{2}$ inch high. The colour of the pileus varies in shade, but is generally a yellowish-orange or brown; it is an inch or a little more in diameter, often cracked, and subject to frequent irregularities in form, but never becomes concave. "If two plants happen to be in contact, they often grow into each other and become confluent." The gills are coloured like the pileus, two in a set, and decurrent.

4. *A. flaccidus*, stalk yellow-brown, cylindrical, curved; pileus flattened, brown, leathery, smooth; gills yellow-brown, numerous, very decurrent.—SOW. *Fung.* t. 185.

Hab. On a turf wall near Longformacus, Berwickshire, abundantly. Autumn.

This fine species is dry, coriaceous, of an orange-brown or chestnut colour. Stalk not quite central, curved, 1 or 2 inches long, scarcely $\frac{1}{2}$ inch in diameter, solid. "The pileus is thin, and resembles tanned leather; it is often prettily stained or blotched in an advanced state;" flattened or depressed in the centre, the margin involute, polished, frequently 4 or 5 inches in diameter; flesh very pale yellow. Gills numerous, narrow, sometimes branched. The *Ag. adscendens* of BOLTON, tab. 55., has some things in common with our plant, and may be the same, for the outlines and colouring of the figures in that work are always indifferent, and often very faulty.

5. *A. Listeri*, stalk thick, greyish, cylindrical; pileus large, bluish-grey, smooth, depressed in the centre, becoming funnel-

shaped; gills whitish, very numerous, narrow.—WITH. iv. 190. Sow. *Fung.* t. 245. *Ag. plumbeus*, GREV. *Fl. Edin.* 374.

Hab. Woods. Blackadder plantations. Wooded banks of the Dye at Longformacus. Autumn.

Stalk short, thick, bluish-grey, smooth, rarely exactly central, narrowed at the base, hollow at least when old. Pileus bluish-grey, varnished, depressed in the centre, becoming funnel-shaped, with an even, circular, frequently inflected margin. Gills white, very numerous, decurrent, rather narrow, 4 in a set. Flesh white, with a milky, acrid, and very nauseous juice. Length of the stalk $1\frac{1}{2}$ or 2 inches; diameter $\frac{1}{2}$ to 1 inch. Diameter of the pileus from 2 to 4 inches. The trivial name *plumbeus* is very expressive of the colour of this agaric, but I feel unwilling to relinquish that of Dr WITHERING, because it has the claim of priority, and because it commemorates Dr LISTER, physician to Queen ANNE, a man of such eminence in science, that naturalists may be proud to reckon him in their number.

6. *A. Celicioides*, “pileus tomentose, dingy pale reddish or salmon colour; lamella yellowish; stipes robust, partly hollow.”—GREV. *Fl. Edin.* 373.

Hab. Amongst some natural wood on the banks of the Dye at Longformacus. Autumn.

Stalk about 3 inches high, thick, cylindrical, straight, flesh-red, hollow when old. Pileus funnel-shaped, regular, fawn, with a darker centre, very shaggy all over, the margin circular and inflected. Gills light fawn, numerous, not broad, 4 in a set, apparently decurrent. Flesh white, with a scanty milky juice. I have seen no figure of this large and fine species, but it answers very well to Dr GREVILLE's description. The two larger figures of *Ag. torminosus* in tab. 103. of SOWERBY's *Fungi*, will give a tolerably correct idea of it, nor, indeed, do I think it distinct from that plant, which is the *Ag. piperatus* of WITHERING, iv. 205.

†† *Gills fixed.*

7. *A. elephantinus*, “gills yellowish-white, fleshy, wide apart, 4 in a set; pileus brown-yellow, changing to black and cracking; stem white,” very thick.—WITH. iv. 232. Sow. *Fung.* t. 36.

Hab. Woods. Penmanshiel wood. Autumn.

A large species, which in decaying gradually turns quite black, as if burnt to charcoal, and in this state may be observed in our woods tossing about for some time. "The gills often branch, and run one into another, but are always clumsy. This fungus has a pleasant nut-like taste; when cut it changes reddish."—SOWERBY.

8. *A. integer*, stalk thick, cylindrical, smooth; pileus convex, becoming cupped, smooth, the margin even and entire; gills white, even, numerous and close, fleshy.—LIGHTF. *Scot.* 1009. BOLT. *Fung.* t. 1. WITH. iv. 227. Sow. *Fung.* t. 201. HOOK. *Scot.* ii. 20. *Ag. emeticus*, GREV. *Fl. Edin.* 372.

Hab. Woods, and sometimes at hedge sides. Autumn.

The pileus is generally of a crimson colour, often spotted, sometimes pure white, but varies much in this respect; it is always smooth, and does not split even when in old age it becomes cupped. It measures 3 or 4 inches across, and is supported on a stalk 2 inches high, white or purplish, as thick as a man's finger, rather narrowed at the base. It is a compact fleshy agaric, and would last a considerable time, did not the larvæ of some flies almost uniformly hasten its decay. Slugs are likewise very fond of it; and although in this country suspected to be deleterious, it is said to be frequently eaten by the Germans and Russians.

9. *A. graveolens*, gills white, very numerous, irregular, 4 in a set; pileus white, smooth, plane; stem white, tapering.—WITH. iv. 213. PURT. *Mid. Fl.* iii. 206.

Hab. At the roots of hedges amongst grass, and in old pastures. May.

Stem 2-3 inches long, from $\frac{1}{2}$ to 1 inch in diameter, subcylindrical, more or less crooked, white, solid, fibrous. Pileus plane, more or less undulated, 3 or 4 inches across, white, tinged with brown, smooth, the margin generally inflexed. Flesh snow-white, juiceless. Gills fixed, rather narrow, numerous and close, watery-white, 4 in a set, often somewhat decurrent. Continues a long time, being firm and rather dry. It appears in May, growing in small clusters, every individual plant, however, being separate; and sometimes it forms fairy rings, of which we have seen a fine example on the bank at Hudshead. It has a strong fungous smell, and is besides well distinguished by its size, its uniform white colour, and by the time of its appearance.

The *Ag. graveolens* of SOWERBY, tab. 281., is different, and I think no other than *Ag. terreus*.

10. *A. violaceus*, gills purple, numerous, 8 in a set; pileus purple to brown, convex, edge turned down; stem purple, cylindrical.—WITH. iv. 242. LIGHTF. Scot. 1018. Sow. *Fung.* t. 209. HOOK. Scot. ii. 20. GREV. *Wern. Mem.* iv. 364; *Fl. Edin.* 386.

Hab. Amongst long grass at dike sides near woods, not uncommon. Autumn.

Stem 2 or 3 inches high, thick, solid, light purple, hoary or somewhat cottony, bulbous at the base. Pileus slightly convex, smooth, brown, the margin inflected except when very old; flesh spongy, white, with a purple taint. Gills always purple, numerous, 4 in a set. As large or larger than the common mushroom, and distinguished by being always more or less of a violet colour. It is sometimes sold at Covent-garden market, under the name of *blewits*, for making ketchup.—Sow. “This,” says BRYANT, “requires much boiling, but when sufficiently done and seasoned, it is as delicious as an oyster.” In SOWERBY’S figures the stalk is represented more cottony than I have seen it; the gills are also too faintly coloured, and the colouring of the pileus does not correspond to what I have observed.

11. *A. subpurpurascens*, stalk bulbous, cylindrical, stained with light-purple; pileus smooth, brown, rounded, the edge purplish and turned down; gills reddish-brown, numerous.—WITH. iv. 240. *Ag. glaucopus*, Sow. *Fung.* t. 223, *bene.* GREV. *Fl. Edin.* 386.

Hab. Plantations, not common. New-water-haugh wood. Autumn.

Stalk 2 or 3 inches high, thick, solid, brown, with a rich purple tint, which is finest and always present near the top. Pileus 3 inches across, convex, flattened on the top, smooth, chestnut-brown, with a purple tinge on the margin. Gills numerous, broad, ventricose, fixed, but separating easily. Flesh white, tinged with purple. Single or in small clusters. It is a compact dry species, certainly distinct from every variety of the preceding.

12. *A. deliciosus*, stem short and thick, orange; gills orange, numerous, rather close, branched; pileus plane, depressed in the

centre, light reddish-brown, with darker concentric circles; juice very fine orpiment orange, mild.—WITH. iv. 203. Sow. *Fung.* t. 202. GREV. *Fl. Edin.* 374.; Wern. *Mem.* iv. 366. PURT. *Mid. Fl.* iii. 187.

Hab. Blackadder plantations; and in a plantation between Fishwick and West Fishwick. Sept.

The stalk is sometimes as thick as a man's finger, never more than 2 inches high, slightly tapered at the base, solid, but pithy in the centre. The gills are slightly decurrent, more or less dichotomous, and rather narrow, becoming dirty green in decay. Pileus from 3 to 6 inches in diameter, inflexed at the margin, but plane in old age. The whole plant abounds with a fine yellow-orange juice, tasteless, becoming colourless or dirty green on exposure for some time to the air. Dr WITHERING conjectured that this might be the mushroom in which AGRIPPINA administered poison to her husband CLAUDIUS, but the conjecture, according to Dr GREVILLE, is erroneous. It is much esteemed on the Continent. When Sir J. E. SMITH visited Marseilles, he says: "The market exhibited a profusion of spring flowers, and even carnations, intermixed with grapes, dates, pomegranates, and a prodigious quantity of *Agaricus deliciosus*, which really deserves its name, being the most delicious mushroom known; though it must be confessed nothing can be less attractive than its appearance, its colour being a dirty brown, and the juice of a deep orange, soon turning to a livid green, wherever the fungus is touched or bruised." Climate is known to alter the qualities of mushrooms in some degree, but in this instance this seems not to be the case. "I had one dressed," says Mr SOWERBY, "which was very luscious eating, full of rich gravy, with a little of the flavour of mussels."

13. *A. rutilans*, pileus convex, deep-yellow, more or less covered with crimson-red squamulose fibres; gills rounded, numerous, yellow; stipes solid or partly hollow, streaked with red.—GREV. *Fl. Edin.* 371. *Ag. xerampelinus*, Sow. *Fung.* t. 31. PURT. *Mid. Fl.* iii. 210.

Hab. On stumps of fir-trees in Blackadder plantations, sparingly. Oct.

Stem curved, thick, somewhat compressed, hollow, purple on a yellowish ground, furfuraceous, $2\frac{1}{2}$ inches high, $\frac{3}{8}$ ths in diameter. Pileus plane, 4 inches across, villose and scaly,

purplish-brown on a yellow ground, deepest in the centre, which is slightly umbonate; margin thin and entire. Gills kings-yellow, numerous, broad, fixed 4 in a set; flesh yellowish, without a coloured juice. Probably poisonous.

14. *A. stipitis*, clustered, dry; stalk cylindrical, firm, fibrillose, with a persistent collar; pileus circular, slightly convex, scaly, yellow-brown; gills dull white, rather distant, numerous.—WITH. iv. 224. Sow. *Fung.* t. 101. Hook. *Scot.* ii. 20. *Ag. melleus*, GREV. *Fl. Edin.* 371.; *Crypt. Fl.* t. 332.

Hab. About the stumps of trees in woods, not uncommon.

This attains a good size, and is distinguished by its dry rigid texture. Its circular pileus often cracks, but never turns up in decay. It remains long unchanged. Poisonous. "Almost all fungi are injurious which grow in a tufted manner, and especially those on the trunks of trees, and similar situations."—GREVILLE.

15. *A. muscarius*, stalk white, ringed, with a bulbous root; gills white, numerous; pileus scarlet, spotted with whitish warts.—LIGHTF. *Scot.* 1010. WITH. iv. 217. Sow. *Fung.* t. 286. BOLT. *Fung.* t. 27.; and *Ag. nobilis*, tab. 46. *Amanita muscaria*, Hook. *Scot.* ii. 19. GREV. *Fl. Edin.* 369.; *Crypt. Fl.* t. 54.

Hab. Amongst brushwood in a heathy soil. From Cheviot, Dr Thomson. Near Longformacus, Berwickshire, abundant. Autumn.

Stalk 3-6 inches high, thick, straight, cylindrical, bulbous and scaly at the base, somewhat enlarged at the top, and furnished with a large fixed collar. Pileus at first hemispherical, becoming in its progress nearly plane, and ultimately a little cupped. It varies in colour from a uniform scarlet to orange-yellow, the red appearing only in the centre; and it is sometimes almost naked, or destitute of those angular white or cream-coloured warts which in general so agreeably relieve the ground colour. Gills broad, ventricose, close. Flesh white, tinged with orange-yellow. The most beautiful of the agarics; but let no one be tempted by its appearance to apply it to domestic use, for a poison lurks beneath its brilliant colours. LINNÆUS informs us that in Finmark they cut it into small pieces, mix them with milk, and place it at their windows for the purpose of poisoning flies, to which it proves as fatal as arsenic. In corroboration of this fact, I have observed

that the flies which sip of the dirty yellow liquor into which this fungus dissolves, die almost immediately. HALLER relates that six persons of Lithuania in Poland perished at one time by eating it. The Ostiacks in Siberia, and the Kamtschatdales and Koriacks, however, use it for the purpose of producing intoxication. They "sometimes eat it dry, sometimes immersed in a fermented liquor made with the *Epilobium*, which they drink notwithstanding the dreadful effects. They are at first seized with convulsions in all their limbs, then with a raving such as attends a burning fever; a thousand phantoms, gay or gloomy according to their constitutions, present themselves to their imaginations; some dance, others are seized with unspeakable horrors. They personify this mushroom, and if its effects urge them to suicide, or any dreadful crime, they say they obey its commands. To fit themselves for premeditated assassinations, they take the *Moucho-more*, the Russian name of this agaric. Such is the fascination of drunkenness in this country, that nothing can induce the natives to forbear this dreadful potion."—PENNANT. For some further particulars relative to its operation, the curious reader is referred to the *Wernerian Memoirs*, vol. iv. 344. It has been used in medicine, but its properties, and the principle on which they depend, seem very imperfectly known. See CHRISTISON on Poisons, p. 655.

16. *A. latus*, gills pale flesh colour or white, 8 in a set, but irregular; pileus brown-mouse, convex, rather bossed; stem white, cylindrical—WITH. iv. 267. BOLT. *Fung.* t. 2, the description good and the figure very bad. Sow. *Fung.* t. 108.

Hab. In woods amongst long grass, and in old pastures, not common.

Stalk bulbous, cylindrical, white or greyish, fibrous, solid, 3 inches high, thickish. Pileus from 3 to 6 inches across, plane, becoming a little concave, smooth, mouse-coloured; flesh white, juiceless. Gills dull white or light brown, numerous, 8 in a set. "When young the gills are mostly white, changing to pink in a few hours after gathering, or as it advances in age, till it sheds a snuff-coloured powder, the gills then being brownish."—SOWERBY. There is an apparent hairiness in the pileus of SOWERBY's figure, of which there was nothing visible in our specimens.

17. *A. terreus*, clustered, hard and dry; stem thickish, white, generally compressed; pileus plano-convex, with an involute

margin, earthy-brown, often cracked; gills numerous, firm, dull white.—WITH. iv. 220. Sow. *Fung.* t. 66.

Hab. Hedge bottoms, in shrubberies and in gardens, not uncommon. Autumn.

Stalk 2 inches long, generally $\frac{1}{2}$ inch in diameter, sometimes much broader, compressed, white, contracted at the base. Gills firmly fixed, even, numerous, but not close, 4 in a set, of a dull watery white colour; flesh white. Pileus obtusely conical or nearly plane, dirty yellow-brown, 2 inches or more in breadth, the margin turned in or plane. Springs up in remarkably compact roundish clusters, which are often little less than a man's head, and endure for a long time. Several of these clusters may sometimes be observed placed in a line at equal distances; and, according to Major VELLEY, they sometimes form great circles 10 or 15 yards in diameter. If a cluster is destroyed, another will in a short time grow up in the same spot, and if that be crushed it will be succeeded by a third; a fact of which I have taken particular notice, and which proves that all agarics do not exhaust their parent soil, and render it unproductive of their own species. Sometimes it grows single, or in a cluster of only 2 or 3 individuals, which has been the case with the specimens figured by SOWERBY.

18. *A. fusco-flavus*, "gills dark cinnamon, 4 in a set; pileus brown-yellow, convex, bossed, edge turned down; stem brown-yellow, splitting."—WITH. iv. 286. *Ag. hinnuleus*, Sow. *Fung.* t. 173. *Ag. helvolus*, GREV. *Fl. Edin.* 387.

Hab. Woods. Autumn.

Stalk 1–2 inches high, thick as a swan's quill, narrowed at the base, round or compressed, yellowish-brown, firm, hollow when old. Pileus brown, smooth, convex, with the edge turned down, becoming flat, umbonate, sometimes cracked at the margin, which is thin. Gills cinnamon colour, 4 in a set, distant, ventricose, adnate, but easily separating. A vestige of a ring is generally to be seen towards the top of the stalk, and the whole plant is dry.

19. *A. cinnamomeus*, stalk cylindrical, yellowish; pileus plane or convex, umbonate, smooth, cinnamon colour; gills lighter cinnamon, broad, rather distant, dry and wringled.—LIGHTF. *Scot.*

1019. WITH. iv. 293. Sow. *Fung.* t. 205, opt. HOOK. *Scot.* ii. 22. GREV. *Fl. Edin.* 386.

Hab. Woods. Blackadder plantations. Autumn.

Stalk 2 inches, thick as a goose quill, smooth. solid. Pileus about 2 inches in diameter, glossy, very thin at the margin, and generally torn. It is a light dry species, and is readily distinguished by this and its cinnamon colour.

20. *A. aurantius*, stalk yellow or bright red, splitting; pileus conical, yellow, orange or red, glutinous, uneven at the edge; gills yellow, fleshy, 8 in a set.—LIGHTF. *Scot.* 1025. BOLT. *Fung.* t. 67. f. 2. WITH. iv. 297. Sow. *Fung.* t. 381. HOOK. *Scot.* ii. 22. *Ag. conicus*, GREV. *Fl. Edin.* 377.

Hab. Old pastures, very common. Autumn.

Stalk 2 inches high, generally compressed and twisted, splitting. smooth, yellow, orange, or bright red. Pileus irregular, with an uneven margin, gummy, smooth, as variously coloured as the stalk. Gills always yellow, broad, ventricose, slightly adherent, and rather widely set. Flesh thin, yellowish: tender and brittle. "It may be bleached or lighter coloured in dry or sunny weather; in damp weather it becomes twisted and deformed; occasionally the moisture of the fungus partly going off. the remainder becomes black and like charcoal. This last change is very common, but does not always happen."—SOWERBY.

21. *A. psittacinus*, viscid, green and yellow; stalk cylindrical, splitting; pileus campanulate, spreading, striate when moist; gills fleshy, distant, yellow.—WITH. iv. 299. Sow. *Fung.* t. 82. GREV. *Crypt. Fl.* t. 74.; *Fl. Edin.* 376.

Hab. Old pastures, not rare in autumn.

This is often found in company with *Ag. aurantius*, which it closely resembles, and from which "it is best distinguished by the green tinge at the upper part of the stipes, which is retained almost to the last."—SOWERBY.

22. *A. tortilis*, gills brown, distant, 4 in a set; pileus reddish-brown, convex, turning up with age; stem brown, cylindrical.—WITH. iv. 244. BOLT. *Fung.* t. 41. f. A.

Hab. At hedge bottoms, and in rich old pastures.

A small species, of a brown colour, the gills and stalk being merely a shade lighter than the pileus. Stalk 1 inch long, as thick as a crow or turkey quill; pileus smooth, sometimes fully 1 inch across and turning up in age so as fully to expose the gills. In habit it resembles *Ag. muralis*, Sow. *Fung.* t. 322, and I think can be nothing but a variety of that plant, although I find it very constant in its appearance in this neighbourhood, where it is common.

23. *A. ramealis*, stalk solid, curved, short; pileus convex, circular, white, tinged with brown; gills distant, white, 2 or 4 in a set.—GREV. *Fl. Edin.* 381. *Ag. horizontalis*, Sow. *Fung.* t. 341. *Ag. candidus*, BOLT. *Fung.* t. 39. D.

Hab. Parasitical on decaying branches of trees.

Gregarious, but never clustered, of a uniform brownish-white colour. dry. Stalk cylindrical, minutely furfuraceous, as thick as a stout pin, firm. Pileus 3 or 4 lines in diameter, smooth.

24. *A. androsaceus*, stalk filiform, dark brown, paler at the top, smooth, tough; pileus slightly convex, dimpled, obsoletely ribbed, light wood-brown; gills pale brown, distant, 2 in a set, ventricose.—Sow. *Fung.* t. 94. GREV. *Fl. Edin.* 381.

Hab. Parasitical on decayed branches, fir cones and leaves, &c. in woods, abundant.

Stalk 1–2 inches high, solid. Pileus $\frac{1}{4}$ inch in diameter, dry, and rather leather-like, thin. "This species often produces very slender barren stems, which are much branched and entangled, some of the branches being as fine as a human hair. FRIES has rightly conjectured it in this state to be *Rhizomorpha setiformis* of PERSEON."—GREV.

+++ *Gills loose.*

25. *A. campestris*, stalk somewhat bulbous, smooth, white, with a veil; pileus semi-orbicular, more or less scaly, white, tinged with red, inflected at the margin; gills flesh-red, changing to liver-brown, numerous, broad, ventricose.—WITH. iv. 265. LIGHTF. *Scot.* 1016. Sow. *Fung.* t. 305. HOOK. *Scot.* ii. 21. GREV. *Wern. Mem.* iv. 354; *Fl. Edin.* 390; *Crypt. Fl.* t. 161. *Ag. esculentus*, GOOD'S *Study of Medicine*, i. 207.

Hab. Old pastures in autumn.

- This is our common mushroom, which for long has been esteemed an article of epicurean delicacy, and is extensively used in making *ketchup*. When it has proved deleterious to those who eat it, the injury ought rather to be attributed to some peculiar idiosyncrasy of the individual than to any poisonous quality in the mushrooms. We, indeed, almost annually read of people being poisoned by them, but other agarics have been in these cases gathered in place of the *Ag. campestris*. "I have seen," says Dr CHRISTISON, "those who gather mushrooms near Edinburgh for the purpose of making ketchup, picking up every fungus that came in their way."
- "As there is no critical mark to determine at once between poisonous and salutary mushrooms, we may lay it down as a general rule, that those should be suspected and avoided that grow in moist and marshy grounds, and especially in the shade; that have a dirty looking surface, and whose gills are soft, moist, and porous."—Dr GOOD. "It appears that most fungi which have a warty cap, more especially fragments of membrane adhering to their upper surface, are poisonous. Heavy fungi, which have an unpleasant odour, especially if they emerge from a *vulva* or bag, are also generally hurtful. Of those which grow in woods and shady places, a few are esculent, but most are unwholesome; and if they are moist on the surface they should be avoided. All those which grow in tufts or clusters from the trunks or stumps of trees ought likewise to be shunned. A sure test of a poisonous fungus is an astringent, styptic taste, and perhaps also a disagreeable, but certainly a pungent odour. Some fungi possessing these properties have indeed found their way to the epicure's table, but they are of very questionable quality. Those whose substance becomes blue soon after being cut are invariably poisonous. Agarics of an orange or rose-red colour, and boleti which are coriaceous or corky in texture, or which have a membranous collar round the stem, are also unsafe: but these rules are not universally applicable in other genera. Even the esculent mushrooms, if they are partially devoured by insects, and have been abandoned, should be avoided, as they have in all probability acquired injurious qualities which they do not usually possess. These rules for knowing deleterious fungi seem to rest on fact and experience, but they will not enable the collector to recognise every poisonous species."—Dr CHRISTISON.

"The meadow mushrooms are in kinde the best,
It is ill trusting any of the rest."

GERARDE.

26. *A. Georgii*, stalk thick, cylindrical, white, with a persistent collar; pileus convex or almost plane, fleshy, white, smooth, dry; gills white, changing to pink and dark brown.—Sow. *Fung.* t. 304. GREV. *Fl. Edin.* 390. *Ag. edulis*, GREV. *Wern. Mem.* iv. 356.

Hab. On the links near the sea, abundant. Autumn.

Nearly allied to the preceding, yet certainly distinct, and readily distinguished by those familiar with the true mushroom. "This," says SOWERBY, "always partakes of the same form as the mushroom, but is generally of a firmer texture, whiter, and smoother, sometimes stained with blotches of yellow, more particularly if touched or bruised." The pileus is at first egg-shaped, and the gills are cream-coloured, but the one soon becomes almost plane, and the other of a dark reddish-brown. It attains a large size, and preserves a circular entire form. The people in Essex call it white-caps, and the name is peculiarly apt and expressive of its common appearance. It will make as good, or nearly as good, ketchup as the *Ag. campestris*; and for other purposes, according to Dr GREVILLE, is as good, but if meant to be eaten, must be gathered before the gills have become dark. Indeed, after that time, I have always found it eaten up with worms; for although to the eye it may appear sound and vigorous, yet under its *untouched* skin revel a swarm of maggots, in all the luxury of plenty, and secure from every foe.

27. *A. oreades*, dry, coriaceous, yellowish or dirty white; stalk cylindrical, tough, smooth; pileus plane, umbonate; gills distant, ventricose, whitish.—WITH. iv. 256. HOOK. *Scot.* ii. 21. GREV. *Wern. Mem.* iv. 358; *Fl. Edin.* 379; *Crypt. Fl.* t. 323. *Ag. coriaceus*, LIGHTF. *Scot.* 1020.

Hab. Old short pastures, particularly on our sea-banks and links, common. Summer.

A well marked species, much esteemed on the continent, being dried, and afterwards used in the form of powder, to add a flavour to many sauces. It is not used in this neighbourhood.

The fairy rings so common on our grassy links and old pastures, and where

" ——— of old, the merry elves were seen,
Pacing with printless feet the dewy grass,"

were, when this land was "ful filled of faerie," believed to be the result of their reels; but now, when no man can

“see non elves mo,” another explanation has become necessary, and the only good one which has been offered is that which attributes them to the peculiar manner of growth which this and one or two other agarics affect. They spring up in circles. Each circle seems to exhaust the soil of some peculiar nourishment necessary for the growth of the fungi, and is rendered incapable of producing a second crop. Hence the circle must necessarily enlarge, for “the defect of nutriment on one side, would necessarily cause the new roots to extend themselves solely in the opposite direction, and would occasion the circles of fungi continually to proceed by annual enlargements from the centre outwards. An appearance of luxuriance of the grass would follow as a natural consequence, as the soil of an interior circle would always be enriched by the decayed roots of the fungi of the preceding year’s growth.” Dr WITHERING was the first to offer this explanation of a very curious phenomenon, and it seems satisfactorily established by the subsequent observations of Dr WOLLASTON.

28. *A. peronatus*, stalk cylindrical, woolly, wood-brown, tough; pileus convex or campanulate, obtuse, wood-brown, very thin; gills wood-brown, rather distant, 4 or 8 in a set, ventricose.—Sow. *Fung. t.* 37. GREV. *Fl. Edin.* 379.

Hab. In woods, firmly attached by its woolly root to decayed leaves and straws. Blackadder plantations. Sept.

Stalk as thick as a goose quill, 3 inches long. Distinguished by its uniform brownish colour, the woolliness of the stem, the thinness of its flesh and its obtuse campanulate leather-like pileus, which is 2 inches in diameter.

* * *Stalk central and hollow.*

† *Gills fixed.*

29. *A. laccatus*, gregarious, dry, coriaceous; stalk cylindrical, twisted, roughish; pileus irregular, convex, dimpled in the centre, roughish; gills distant, thick, broad, somewhat decurrent.

Var. 1. of a uniform reddish flesh colour.—GREV. *Fl. Edin.* 377; *Crypt. Fl. t.* 249. *Ag. farinaceus*, WITH. iv. 272. Sow. *Fung. t.* 208. HOOK. *Scot. ii.* 22.

Var. 2. stalk thickened upwards; gills purple.



11

PLATE II



PLATE III

12



Var. 3. of a uniform purple-violet colour. *Ag. amethystinus*, Sow. *Fung.* t. 187. HOOK. *Scot.* ii. 20. GREV. *Fl. Edin.* 378.

Hab. In woods and at hedge bottoms, not uncommon. Aut.

Grows in small tufts or singly. It has a tough somewhat leather-like appearance, but, with the exception of the stalk, is rather brittle. The pileus is generally somewhat more than an inch across, sometimes it is fully 3 inches, and is more or less depressed in the centre. The gills are remarkable for their breadth and thickness, and discharge a mealy powder from their whole surface.

30. *A. velutipes*, clustered; "gills pale yellow, 8 in a set; pileus brown orange, nearly flat; stem yellow above, velvety and dark brown below."—WITH. iv. 326. Sow. *Fung.* t. 384. f. 3. GREV. *Fl. Edin.* 378.

Hab. On decaying stumps of trees, not uncommon. Wint.

Stalk 2-4 inches, generally curved, cylindrical, dark brown, paler upwards, velvety, hollow, matted together at the base. Pileus plane and circular, glutinous when moist, 2½ inches across, or less; flesh brown. We have never seen any thing like SOWERBY's figure, tab. 263. but the figure above quoted is a good representation of a single and rather small plant.

31. *A. fascicularis*, clustered; stalk cylindrical, yellow, with a slight evanescent collar; pileus plane, umbonate, yellowish orange; gills close, numerous, greenish.—WITH. iv. 303. BOLT. *Fung.* t. 29. Sow. *Fung.* t. 205. GREV. *Fl. Edin.* 392; *Crypt. Fl.* t. 329.

Hab. On the stumps of decaying trees in woods, common. Aut.

32. *A. lateritius*, clustered; stems unequal, cylindrical, pithy, curved; pileus obtusely conical, irregular, brown or reddish-orange, paler towards the margin; gills grey-green, numerous.—GREV. *Fl. Edin.* 392. *Ag. fascicularis*, var. 3. WITH. iv. 304. BOLT. *Fung.* t. 29. (tab. nost. 6. fig. med.)

Hab. On the roots of old hawthorn in hedges. Aut.

This and the preceding are so nearly related, that they were considered varieties of the same species by Dr WITHER-

ING. The *Ag. lateritius* is drier and more corky, the stalk thicker in proportion to the length, the pileus less expanded, smaller and darker coloured; but the principal distinction lies, as I think, in their mode of growth. The various individuals composing a tuft of *Ag. fascicularis* rise to nearly an equal height, and, from the flatness of the pileus, it appears to be almost level-topped; but in *Ag. lateritius* the plants are more closely clustered, and they rise in tiers one above another, as is well expressed in our figure,—the higher sitting upon and overshadowing those beneath them.

33. *A. semiglobatus*, stalk cylindrical, slender, rather tough, yellowish; pileus semiglobular, yellow or reddish-orange, varnished; gills grey, mottled, very broad, and rather distant.—WITH. iv. 306. Sow. *Fung.* t. 248. HOOK. *Scot.* ii. 23. GREV. *Fl. Edin.* 391; *Crypt. Fl.* t. 344. *Ag. virosus*, Sow. *Fung.* t. 407.

Hab. In old pastures near dung, common.

Stalk in general about 3 inches long, thicker than a crow-quill, tough, hollow, more or less waved near the base, slightly stained with black near the top—the remains of the collar. The gills “form an horizontal line from the stem to the edge of the pileus,” which measures about an inch in diameter, sometimes more, commonly not so much. It is smooth, thin, viscid and gummy in moist weather, retains its semiglobular shape during its course, and remains a long time. Mr SOWERBY mentions that a family at Mitcham, in Essex, were poisoned by eating some of this mushroom; but Dr GREVILLE doubts whether this was really the species. It is very certain that many of SOWERBY’s figures, in his tab. 407 and 408, represent fungi distinct from *Ag. semiglobatus*, which is remarkable for constancy to its characters. “Accidents arising from the deadly fungi being mistaken for eatable mushrooms, are common on the Continent, and especially in France. They are by no means unfrequent, too, in Britain; but they are much less frequent than abroad, because the epicure’s catalogue of mushrooms in this country contains only three species, whose characters are too distinct to be mistaken by a person of ordinary skill; while abroad a great variety of them have found their way to the table, many of which are not only liable to be confounded with poisonous species, but are even also themselves of doubtful quality.”—Dr CHRISTISON.

34. *A. semi-ovatus*, "gills brown-grey to black, 2 or 4 in a set; pileus light brown, smooth, half egg-shaped; stem cylindrical, white."—WITH. iv. 331. Sow. *Fung.* t. 131. GREV. *Fl. Edin.*

392. *Ag. ciliaris*, BOLT. *Fung.* t. 53.

Hab. Old pastures, generally near dung.

Stalk 4 inches high, as thick as a swan-quill, cylindrical, smooth, marked with a small ring, frosted above it; perforation small. Pileus campanulate, obtuse, smooth, glossy, a very light brown, larger than an egg divided in the middle. Gills slightly fixed, broad, ventricose, black and sooty with grey edges, not very close. They come very fully down to the margin of the pileus, and can be readily separated into two distinct layers.

35. *A. fimiputris*, gills greyish-brown, sooty, 2 or 4 in a set; pileus mouse-colour, smooth, half egg-shaped; stalk cylindrical, slender, brownish, firm.—WITH. iv. 42. PURT. *Mid. Fl.* iii. 223.

Hab. Old pastures and by road-sides, common. Aut.

Stalk 4 inches high, thick as a crow-quill, purplish-brown, fistular, yet firm and tough. Pileus campanulate, obtuse, about one-half the size of the preceding. Gills fixed, rather wide, broad and ventricose. Certainly distinct from *Ag. semiovatius*, though nearly related to it.

36. *A. varius*, gills white, rather distant, 2 in a set; pileus campanulate, greyish-white, smooth; stalk slender, firm, greyish, smooth and glossy.—WITH. iv. 276. PURT. *Mid. Fl.* iii. 216.

Hab. In damp woods amongst moss, very common. Aut.

A small and neat species, sometimes milky, but the juice small in quantity. Stalk 3 inches high, slender, purplish-brown, with a downy and somewhat bulbous root, which penetrates amongst the moss. The pileus is thin and scored. The *Ag. galericulatus* of SOWERBY, tab. 165, gives a good idea of this species, and is, I presume, the same plant. The only variety of it which I have seen is one with the pileus of a deep black colour.

37. *A. tener*, wood-brown, smooth; stalk cylindrical, slender; pileus conical, smooth; gills 4 in a set; flesh very thin.—WITH. iv. 285. Sow. *Fung.* t. 33. HOOK. *Scot.* ii. 22. GREV. *Fl. Edin.* 389.

Hab. Old pastures, common.

Rather a small species, of a uniform wood-brown colour, the gills being only a little darker and richer than the pileus. Stalk 3 inches high, fistular, hardly so thick as a crow-quill. Pileus a blunt cone, thin and brittle, often wrinkled at the margin. Sowerby's figures are larger than we generally find it, and one of them has too rounded a pileus, but in other respects they agree very well with our plant. *Ag. tener* of PURTON is a different plant.

38. *A. hypnorum*, "minute; pileus campanulate, striate when moist, reddish-buff, becoming pale; lamellæ adnate, rather broad, distant; stipes somewhat crooked, filiform."—GREV. *Fl. Edin.*

389. *Ag. acicula*, Sow. *Fung. t.* 282.

Hab. Amongst moss, common. Among *Hypna* in the rocks in the plantation at Murton Craigs. Aut.

In general not more than an inch high; but in tufts of *Hypnum splendens* we find a fine variety, of which the following is a description. Stalk slender, 2 or 3 inches long, cylindrical, fistular, pale yellow-brown, somewhat cottony. Pileus campanulate, smooth, scored, yellow-brown, nearly half an inch in diameter. Gills yellow-brown, broad, ventricose, distant, 4 in a set, fixed.

39. *A. epiphyllus*, pileus nearly plane, rugose, white; gills few, distant, pure white; stalk filiform, reddish-brown below, the top white, very minutely velvety, 1 inch long —GREV. *Fl. Edin.* 381. *Ag. squamula*, Sow. *Fung. t.* 93.

Hab. On dead leaves in Blackadder plantations.

40. *A. clavus*, minute; pileus semiglobular, orange; gills decurrent, distant, in pairs, whitish; stalk filiform, buff-orange.—BOLT. *Fung. t.* 39. B. GREV. *Fl. Edin.* 380. PURT. *Mid. Fl.* iii. 236.

Hab. Amongst moss in woods, attached to straws, &c.

Stalk about 1 inch high, thick as a pin, minutely pubescent, hollow. Pileus small, minutely pubescent, obsoletely furrowed, sometimes dimpled in the centre, where the colour is deeper.

41. *A. Du-Boisii*, snow-white, small; stalk slender, downy on the lower half; gills in pairs, distant; pileus obtusely campanulate, striate.—Fungi plures juxta se nascentes, parvi, turbinati,

candidi, ubivis coloris, RATH, *Syn.* I. 10. No. 54. tab. 1. f. 2. litt. *a a*.

Hab. On old moss-grown trees, particularly on willows.
Aut.

A very pretty little species, of a pure white colour, and delicate form. Stalk an inch long, more or less curved. Pileus powdery, apparently striate (not furrowed) from the gills appearing through, for it is very thin. Gills ventricose, adherent. Well described by DILLENIIUS in RAY'S Synopsis.

†† *Gills loose.*

42. *A. arundicola*, stalk filiform, dark brown, pubescent, furrowed when dry; pileus circular, nearly plane, dimpled in the centre, light brown, thin, uneven and plaited; gills white, rather distant, 4 in a set, ventricose.—(Tab. nost. 6. fig. inf.)

Hab. Parasitical on the stalks of sea bent. Spittal Links.
Aut.

Stalk 1 inch high, perforated, of a uniform colour. Pileus scarcely half an inch in diameter, brown in the centre, becoming gradually paler towards the edge. It may be dried, and will again revive on immersion in water. It has no smell.

43. *A. spinipes*, stalk long, cylindrical, radicating, light brown, white near the top; pileus plane or convex, smooth, dark brown; gills white, numerous.—Sow. *Fung.* t. 206.

Hab. Parasitical on decayed fir-cones in Blackadder plantations, abundant.

Stalk from 4 to 6 inches long, as thick as a crow-quill, the lower part woolly, and penetrating deep among the decayed leaves of firs, being always attached to a cone or decayed branch. The pileus is neat, circular, convex, very smooth, $\frac{3}{4}$ ths of an inch in diameter. Gills very white, numerous but not close, ventricose, 8 in a set. In a very early state the whole plant is white. Dries well.

44. *A. procerus*, stalk a span high, thick, cylindrical, bulbous at the base, with a moveable collar; pileus large, circular, convex, scaly, earthy-brown; gills white, rather distant.—WITHER, iv. 307.

Sow. *Fung.* t. 190. HOOK. *Scot.* ii. 23. GREV. *Wern. Mem.* iv. 352; *Fl. Edin.* 370. *Ag. annulatus*, LIGHTF. *Scot.* 1025. BOLT. *Fung.* t. 23.

Hab. Grassy banks and near woods. Sea banks a little beyond Spittal quarry. Aug.

A very large and well proportioned species, not liable to be mistaken for any other. Edible.

45. *A. æruginosus*, stalk cylindrical, greenish-blue, downy; pileus obtusely conical, greenish-blue, slimy; gills light pink-brown, numerous but not close, ventricose.—WITH. iv. 294. Sow. *Fung.* t. 264. GREV. *Fl. Edin.* 391.

Hab. Blackadder plantations. Sept.

Stalk as thick as a goose quill, 2 inches long, thicker at the base, marked with the remains of the delicate cob-like veil, hollow. Pileus 1 inch in diameter, often blotted with yellow. Allied to *Ag. psitticinus*.

46. *A. cylindricus*, stalk white, cylindrical, somewhat bulbous; pileus cylindraceous, white, flocculent and scaly; gills close, even, white changing to pink and black.—WITH. iv. 321. Sow. *Fung.* t. 189. HOOK. *Scot.* ii. 23. *Ag. fimetarius*, LIGHTF. *Scot.* 1021. BOLT. *Fung.* t. 44. *Ag. comatus*, GREV. *Fl. Edin.* 393. *Crypt. Fl.* t. 119.

Hab. Meadows, grassy lanes near villages, and sometimes in woods.

This fine species is often gregarious, but never grows in clusters. When full grown, it is about a span high. On its first eruption from the soil it very much resembles an egg in shape and colour, but the pileus soon separates from the stalk, becomes cylindrical, then campanulate, and more or less stained with pinkish-brown and black,—the first symptoms of its rapid decay, when it dissolves into a black ink-like fluid. “A young plant,” says Dr WITHERING, “put into water, and covered with a glass bell, grew $3\frac{1}{4}$ inches in 24 hours,”—a rapidity of growth sufficiently remarkable, yet equalled by several other species. Indeed, the rapid growth of mushrooms in general, is so well known as to have become proverbial, and there has been a time when supernatural agency was deemed necessary to explain the phenomenon—

“ ——— You demy-puppets, that
 By moon-shine do the green-sour ringlets make,
 Whereof the ewe not bites, and you, whose pastime
 Is to make midnight mushrooms.” TEMPEST.

47. *A. ovatus*, clustered; stalk cylindrical, white; pileus ovate, light brown, smooth, plaited; gills very close, even, white, changing to brown and black.—WITH. iv. 327. HOOK. Scot. ii. 24. *Ag. fimetarius*, Sow. *Fung.* t. 188. *Ag. atramentarius*, GREV. *Fl. Edin.* 394.

Hab. At the foot of hedges and gate-posts. Aut.

Stalk white, silky, cylindrical, as thick as a swan's quill, fistular. Pileus ovate, obtuse, light brown or earthy, smooth, generally plaited, and more or less unequal at the edge. Gills so close as not to separate without tearing, even and hoary at the edges, ventricose, at first pure white, becoming in their decay purplish-brown and black. Dissolves slowly into a black liquor.

48. *A. congregatus*, clustered; pileus campanulate, gall-stone-yellow, furrowed; gills rather distant, whitish, changing to black; stalk cylindrical, white, smooth, fistular.—WITH. iv. 315. Sow. *Fung.* t. 261. HOOK. Scot. ii. 23. *Ag. striatus*, BOLT. *Fung.* t. 54, bad. *Ag. micaceus*, GREV. *Crypt. Fl.* t. 76; *Fl. Edin.* 394.

Hab. At the bottom of gate-posts, and about the roots of felled trees, frequent. Aut.

The figures of SOWERBY and GREVILLE are beautiful and characteristic delineations of this species when in its finest state, but it will generally be found less tufted and smaller. I have often seen it scarcely clustered, but merely gregarious, occupying a space of 1 or 2 square yards. The pileus is very thin, and the furrows do not reach the rounded top, which is smooth. When young it often “appears as if spangled with minute particles of mica,” whence one of the names which has been conferred upon the plant; and in decay it tears and turns up, and slowly dissolves into an inky fluid.

49. *A. stercorarius*, stalk tapered upwards, smooth, fistular, white; pileus ovate becoming expanded, revolute and torn, white, cottony; gills distant, black.—WITH. iv. 309. Sow. *Fung.* t. 262. HOOK. Scot. ii. 23. *Ag. ephemerus*, GREV. *Fl. Edin.* 395.

Hab. On dunghills frequent in autumn.

This offspring of the dunghill has some pretension to beauty on its first appearance, when it resembles an elliptical ball of loose cotton. So brittle and tender that it can scarcely be lifted without injury, and without soiling the fingers. It rapidly rises to the height of 4 or 6 inches, dissolves immediately into a black fluid, and in a few hours returns to the corruption whence it sprung. It has great affinity to *Ag. cylindricus*, and LIGHTFOOT seems to have had both species in view when he assigned "dunghills" as a habitat for the latter.

50. *A. plicatilis*, stalk cylindrical, white, smooth, fistular, tender; pileus mouse-grey, membranous, remarkably thin and pellucid, furrowed; gills in pairs, broad, distant, grey, becoming black and sooty, loose, their ends forming a ring round the dilated head of the stem.—WITH. iv. 331. Sow. *Fung.* t. 364.

Hab. Old pastures and road-sides. Aut.

Stalk 3 or 4 inches high, as thick as a crow quill. Pileus about $1\frac{1}{2}$ inch in diameter, convex, as thin as silk paper, the summit brown and smooth. The furrows are not owing to the gills appearing, and the gills themselves are formed by a duplication of the pileus, for the layers can be easily separated.

* * * *With a lateral stalk or sessile.*

51. *A. flabelliformis*, stalk lateral, short, whitish, furfuraceous; pileus leathery, white or brown, furfuraceous; gills yellowish-brown.—WITH. iv. 337. Hook. *Scot.* ii. 24. Sow. *Fung.* t. 109. *Ag. semipetiolaris*, LIGHTF. *Scot.* 1030.

Hab. On moss-grown and decaying trees in woods. Hound-wood.

Gregarious or clustered. Stalk as thick as a crow quill, tough, solid, downy at the base, and dilated at the top. Pileus fan-shaped, fissured and concave at its insertion, thin and leathery, scarcely 1 inch in diameter, often dashed with rust-like stains. Gills 4 in a set, scarcely decurrent, rather narrow, of a rich yellowish-brown, forming a fine contrast with the colour of the stalk and pileus. When moist, the hoary whiteness of this agaric disappears, and it becomes nearly a uniform brown.

52. *A. molis*, sessile, ovate, tender; pileus white, downy or



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smooth, with an involute margin; flesh white, thin; gills repeatedly dichotomous, close, rather narrow, varying from gamboge to saffron-yellow, or brown.—Sow. *Fung.* t. 98. (tab. nost. vii.)

Hab. In saw dust, and on small pieces of rotten wood in the wine-cellar of Mr J. R. Dunlop.

A beautiful and very singular production. At first very cottony, with a much inflected border, and of a circular form, but when full-grown it assumes, pretty constantly, a spoon or mussel shape, and is fixed only by one end to the object on which it grows. I have seen it with a thick short stalk, and occasionally one fungus may be observed to grow from the gills of another.

This will probably be found to be a very imperfect list of the Agarics of N Durham and Berwickshire, for in the immediate vicinity of Berwick there is no place very favourable for their production, and they cannot be easily procured from a distance in a state fit for examination. The genus, according to SPRENGEL, contains 646 species, and this is much below the number described by other authors!—another remarkable example of that variety in which Nature delights. “If we were to make a system on the subject, it should be, that she delights in variety, not in uniformity; in displaying the extent of her resources and means, not their limits; in difficulties overcome, in complexity, not in simplicity. She amuses us with two or three hundred *Ericæ*; with endless species of a genus, differing so slightly, yet still differing, that she compels us to wonder how she has produced variations so numerous, so slender, yet so marked. She even makes us wonder why all this is. There are as many hundreds of mushrooms; of a tribe, the simplicity of which would defeat our attempts to vary them, were the problem given, and which yet do not defeat our labours in distinguishing them. Nature is all variety, invention wealth, profusion. She riots and wantons in her own powers; she dazzles us by her fertility, and astonishes us by her resources. She scorns man and his philosophy, that would bind her down, and measure her by his own narrow powers and conception. This is Nature. These are the wonders of its Almighty Author.”—Dr MACCULLOCH, *but the quotation somewhat altered from the original.*

93. CANTHARELLUS.

1. *C. cibarius*, wholly yellow; stalk central, solid, thickened upwards; gills decurrent, dichotomous; pileus fleshy, smooth, waved, depressed in the centre, the margin slightly involute.—GREV. *Wern. Mem.* iv. 368.; *Fl. Edin.* 396.; *Crypt. Fl.* t. 258. *Merulius cantharellus*, WITH. iv. 180. HOOK. *Scot.* ii. 25. *Agaricus chanterellus*, LIGHTF. *Scot.* 1008. *Ag. cantharellus*, Sow. *Fung.* t. 46.

Hab. Woods. Wooded banks opposite Longformacus.

On the Continent, in general, this is much eaten, and in some provinces the people are said to subsist upon it almost entirely. It appears to be used occasionally in the south of England, but never in the north, where indeed it is by no means common. It is rather tough, and, shortly after being gathered, exhales a pleasant odour like that of apricots.

2. *C. lobatus*, membranous, light wood-brown, roundish or ear-shaped, tapered at the base into an imperfect stalk; upper surface convex, naked; beneath veined, the veins branched, radiating.—GREV. *Fl. Edin.* 397. *Merulius membranaceus*, PURT. *Mid. Fl.* iii. 180. *Helvella membranacea*, Sow. *Fung.* t. 348.

Hab. Parasitical on living mosses. On *Tortula ruralis* on Spittal Links, late in autumn.

94. SCLERODERMA.

1. *S. cepa*, “globose, subdepressed, very firm, smooth or warty, sessile, or with a very short thick stipes; root scarcely any.”—GREV. *Fl. Edin.* 458.; *Crypt. Fl.* t. 66.

Hab. On the ground in plantations. About Netherbyres, plentiful, Rev. A. Baird.

95. LYCOPERDON.

OBS.—The *Lycoperda* have in general the form of a white ball, and grow on the ground. They are at first filled with a white spongy mass, which, in its progress to maturity, changes to a dirty green, and becomes ultimately dark brown and pulverulent,

when it is discharged by an irregular rupture in the top. They are in this state called puff-balls, blind-man's buff, or devil's snuff-boxes. The powder is remarkable for its property of strongly repelling moisture. If a basin is filled with water, and a little of the powder strewed upon the surface so as to cover it thinly, the hand may be plunged into it, and thrust down to the bottom without being wetted with a single drop of water.—KEITH. The common species have been used in some places of England "to kill or smolder their bees, when they would drive the hives, and bereave the poor bees of their meat, houses, and lives. They are also used in some places, where neighbours dwell far asunder, to carry and reserve fire from place to place, whereof it took the name *Lucernarum fungus*."—GERARDE. For the purpose of tinder I have seen them used in Northumberland.

1. *L. bovista*, "large, obconical, soft, whitish, plicate beneath; scales broad, often indistinct." 3-4 inches in diameter.—GREV. *Fl. Edin.* 456. *HOOK. Scot.* ii. 11. *L. proteus*, *Sow. Fung.* t. 332, upper figures.

Hab. Old pastures. Autumn.

2. *L. giganteum*, large, globose, white; membrane double, the outer one smooth, cracking unequally, and falling off.—HOOK. *Scot.* ii. 11. *Bovista gigantea*, GREV. *Fl. Edin.* 458.; *Crypt. Fl.* t. 336.

Hab. Old pastures. WALLIS mentions it as growing on the hilly pastures at Spindleston, where I have seen it as large as a man's head, a size much below what it sometimes attains.

3. *L. pratense*, "white, soft, hemispherical, subsessile, somewhat smooth, warts scattered." Diameter rarely 2 inches.—GREV. *Fl. Edin.* 457. *HOOK. Scot.* ii. 11.

Hab. Moorish pastures, common.

4. *L. excipuliforme*, white, stalked, somewhat pear-shaped, furfuraceous and spinous; spines small, conical.—HOOK. *Scot.* ii. 11. GREV. *Fl. Edin.* 457. *L. proteus*, *Sow. Fung.* t. 332, lower figures. *BOLT. Fung.* t. 117. f. 9.

Hab. Woods in autumn, not uncommon.

Stalk between 2 and 3 inches long, $1\frac{1}{4}$ in diameter, puckered and downy at the base, rather suddenly dilated into a cushion-like head. The spines are often rubbed off in part.

96. LYCOGOLA.

Obs.—The *Lycogolæ* are the productions of decayed wood. They are globose and sessile; soft and pulpy in their earliest stage, but when perfect the seminal mass is pulverulent, enclosed in a thin membranous coat, which bursts irregularly. This powder undergoes some very curious changes in colour during its maturation, and is very light and copious. When SOWERBY informs us that the *Lycoperdons* afford in their ripe state different browns, in a fine impalpable powder, fit for immediate drawing when mixed with a little gum-arabic water, he had probably the *Lycogolæ* in view.

1. *L. argentea*, large, ovate, white or yellowish, highly varnished, gummy when moist, filled with a uniform brown pulverulent mass.—Hook. Scot. ii. 11. GREV. *Fl. Edin.* 453; *Crypt. Fl.* t. 106. *Reticularia lycoperdon*, WITH. iv. 421. Sow. *Fung.* t. 272.

Hab. On decaying gate-posts, &c. rare. Spring.

This is 1 or 2 inches across, adheres by a broad base, and when entire is very like the covering of some chrysalis. The outer coat, as SOWERBY says, resembles parchment, with a silvery gloss, but is very tender; on which account care must be taken in removing it from its station. It opens at last in a very irregular manner to discharge its copious brown powder, which is mixed with a few hair-like fibres.

2. *L. miniata*, clustered, subglobular, bright red when young and pulpy, in age brownish, and filled with a purplish pulverulent mass.—Hook. Scot. ii. 11. GREV. *Crypt. Fl.* t. 38; *Fl. Edin.* 452. *Lycoperdon epidendron*, LIGHTF. Scot. 1068. BOLT. *Fung.* t. 119. f. 1. WITH. iv. 420. Sow. *Fung.* t. 52.

Hab. On the rotten stumps of trees, not common.

In small clusters, each fungus of the size of a pea or larger. When perfect the peridium is greyish, smooth, easily rub-

bed off when moist, and filled with a compact soft homogeneous mass of a purplish colour, which, in drying, becomes an impalpable rose-pink powder.

3. *L. fuliginosa*, clustered, globular; peridium dull black, rough, minutely granular; powder french grey, very copious.

Hab. On stumps of decayed fir-trees in Blackadder plantations. Oct.

Like *L. miniata* in size and figure.

97. ONYGENA.

1. *O. equina*, small, erect, white or cream coloured, furfuraceous; stalk thickish, solid; head globular, containing a compact pulverulent mass of extremely minute grains.—GREV. *Crypt. Fl.* t. 343. *Lycoperdon equinum*, WITH. iv. 413. *Fungi parvi globosi*, &c. RAIL, *Syn.* i. 13. t. 1. f. 3. DILL. *Musc.* t. 14. f. 5.

Hab. On the hoofs of horses which have been long exposed to and softened by the weather, very rare.

The Scotch Flora owes this addition to its catalogue to my friend the Rev. J. BAIRD of Yetholm, who found it in the neighbourhood of that village, vegetating in profusion on a much decayed hoof. There is nothing in the appearance of the fungus to recommend it to our attention, but the *habitat* it has chosen is a very singular one.

Mr BAIRD has also sent me, from the same place, the hoof of a calf, studded over with what may prove a distinct species. This is sessile, subglobular, dull white, furfuraceous, as large as rape-seed, the interior white, with minute pellucid granules mixed with short fibres. Is it the preceding in an early stage?

98. LEOCARPUS.

1. *L. vernicosus*, "obovate, shining, chestnut colour, the peridium fragile; stipes pale, dilated at the base into a membrane; sporules forming a black mass."—GREV. *Fl. Edin.* 453.; *Crypt. Fl.* t. 111. *Lycoperdon fragile*, WITH. iv. 420. Sow. *Fung.* t. 136.

Hab. On fallen branches, and on stems of grasses, in clusters; remarkable for its neatness and beauty. Blackadder plantations. Autumn.

99. CRATERIUM.

1. *C. leucocephalum*, gregarious, glass-shaped, reddish-brown, about 1 line high; the lid very thin and evanescent; filaments and granules whitish; stalk similar in colour to the peridium.—GREV. *Crypt. Fl.* t. 65. *Arcyria leucocephala*, Hook. *Scot.* ii. 13.

Hab. On dead straws, &c. in moist woods, but not common. Winter.

100. PHYSARUM.

1. *P. farinaceum*, stalk black, erect, slightly tapered upwards; head globular, hoary, villose; seminiferous mass black or dark brown.—*Bot. Gall.* ii. 860.

Hab. On decayed beech leaves, and on stalks of thistles and other herbaceous plants, not rare.

Stalk firm, a line high; the head greyish-white, as large as a pin's head, with a membranous peridium bursting irregularly. Grains minute, globular, numerous, mixed with branched fibres.

101. TRICHIA.

1. *T. ovata*, small, gregarious, sessile, ovate, smooth, honey-yellow, the peridium bursting irregularly, filled with a bright yellow mass of innumerable minute granules, intermixed with long twisted thread-like filaments.—Hook. *Scot.* ii. 12. GREV. *Fl. Edin.* 454. *Clathrus turbinatus*, BOLT. *Fung.* t. 94. f. 3. *Trichia turbinata*, Sow. *Fung.* t. 85.

Hab. On rotten wood and mosses in woods and hedges, in clusters resembling the eggs of some insect. Autumn.

2. *T. clavata*, gregarious, stalked; stalk rather long, brown, roughish, erect, slightly tapered; head pear-shaped, erect, glossy, yellow, the membrane separating half way down; seminal mass yellow, the fibres flexuose, simple or branched; grains very numerous, minute, globular, pellucid.—*Bot. Gall.* ii. 859.

Hab. On decayed fir wood in Blackadder plantations.

The upper part of the stalk is yellow. The filaments are

elastic, and when moistened twist and curl themselves like a living mass of worms, projecting the seeds to a short distance.

3. *T. faginea*, densely clustered, pear-shaped, passing into a short stalk, yellowish-brown, roughish or pulverulent; apex obtuse, light coloured; height $1\frac{1}{2}$ line.

Hab. On dead branches of beech, either on the bark or bare wood, and collected into circular clusters, or forming extensive crowded patches.

102. ARSCYRIA.

1. *A. punicea*, gregarious, stalked, ovate-cylindrical, fine crimson-red.—GREV. *Fl. Edin.* 455.; *Crypt. Fl.* t. 130. *Trichia denudata*, WITH. iv. 433. Sow. *Fung.* t. 49. *Clathrus denudatus*, BOLT. *Fung.* t. 93. f. 2.

Hab. On decayed stumps of trees in woods, not common. Autumn.

The colour at first is milk-white, passing through a purplish-red to its proper vermilion. The granules are minute, globular, and very numerous.

103. STEMONITIS.

1. *S. fasciculata*, tufted, purplish-brown, stalked, the head cylindrical, elongated, penetrated by the stalk, its covering vanishing; erect, the height from $\frac{1}{2}$ to 1 inch.—HOOK. *Scot.* ii. 13. GREV. *Fl. Edin.* 455; *Crypt. Fl.* t. 170. *Trichia nuda*, WITH. iv. 433. Sow. *Fung.* t. 50.

Hab. On rotten stumps of fir trees in Blackadder plantations, and in the woods about the Retreat.

104. CYATHUS.

1. *C. crucibulum*, "hard, woody, subcylindrical or somewhat campanulate, ochrey-yellow, subtomentose at the base; smooth and even within."—GREV. *Fl. Edin.* 495; *Crypt. Fl.* t. 34. HOOK. *Scot.* ii. 18. *Nidularia laevis*, WITH. iv. 392. Sow. *Fung.* t. 30. *Peziza crucibuliformis*, LIGHTF. *Fung.* 1049.

Hab. On rotten wood in fields about Eyemouth, Rev. A. Baird.

105. STILBOSPORA.

OBS.—The *Stillbosporæ* appear to be a mere conglomeration of granules separating readily in water, but which we must suppose are naturally held together by some gelatinous substance intermixed. They are of a black colour, produced under the epidermis of trees which they rupture, and the spots they form resemble a little mass of fine gunpowder.

1. *S. biloculata*, black, roundish, bursting through the bark; granules ovate, obtuse, 2-celled.—GREV. *Fl. Edin.* 366.

Hab. On dead branches of the whin, common.

2. *S. conglomerata*, spots roundish, very black, pulverulent, bursting through the epidermis; granules very minute, globular or pear-shaped, undivided.—*Melanconium conglomeratum*, LINK in WILD. vi. ii. 92. *Bot. Gall.* ii. 884.

Hab. On branches of a willow, in spots about a line in diameter.

3. *S. microsperma*, spots small, round, convex, covered in general by the raised epidermis; granules very numerous, oblong, pellucid, undivided.—GREV. *Fl. Edin.* 366. MOUG. and NEST. No. 384.

Hab. On dead branches of beech and willow.

4. *S. betulina*, spots oval, convex, spreading widely at the base, yellowish; granules oval, 2-celled, minute.—PERSOON. *Didymosporium betulinum*, GREV. *Crypt. Fl.* t. 273.

Hab. On branches of dead birch-trees, produced beneath the epidermis, and bursting through in the form of little deep black conical masses, 1–3 lines in breadth. Sent from the neighbourhood of Wooler, by James Mitchell, Esq. surgeon, R. N.

106. SEPTARIA.

1. *S. Ulmi*, spots small, scattered, white or very light rose-colour, at length effused and irregular; grains cylindrical, curved, tapered at one end, divided by 3 or 4 septæ.—GREV. *Crypt. Fl.* t. 112.

Hab. On the inferior surface of elm leaves, not rare.

In our specimens, the spots formed by this parasite are white and cottony-like, resembling, in some respects, the covering of the Aphides. The matter diffuses readily in water, and it consists entirely of minute slender filaments (sporidia), slightly curved, and divided by some imperfect septæ. These are the seminiferous tubes which have escaped from a capsule lying immersed in the substance of the leaf.

107. PUCCINIA.

* *Capsules with more than two cells.*

1. *P. Rosæ*, capsules cylindrical, many-celled, mucronate, opaque, reddish-brown, on a rather long pellucid stalk thickened at the base.—*PERT.* *Mid. Fl.* iii. 301. t. 28. *GREV.* *Crypt. Fl.* t. 15; *Fl. Edin.* 428. *P. mucronata*, α , *HOOK.* *Scot.* ii. 17.

Hab. On the under surface of the leaves of the dog and burnet roses, frequent; more common on the garden rose. Summer.

Scattered over the leaf in minute black tufts, often intermixed with a yellow *Uredo*, as represented in the figure given by Mr *PURTON*, who did not distinguish the plants.

2. *P. Rubi*, capsules cylindrical, 4-celled, mucronate, opaque, blackish-brown, the stalk elongate, slender, bulbous at the base.—*PERT.* *Mid. Fl.* ii. 726. iii. 507. *Sow. Fung.* t. 400. f. 9. *GREV.* *Fl. Edin.* 428. *P. mucronata*, β , *HOOK.* *Scot.* ii. 18.

Hab. On the under surface of the bramble, common, in small black tufts. Autumn.

3. *P. gracilis*, capsules cylindrical, 7 or 8-celled, mucronate, opaque, blackish, on a slender stalk thickened at the base.—*GREV.* *Fl. Edin.* 428. *P. rubi-idæi*, *DECAND.* *Fl. Franc.* vi. 54.

Hab. On the leaves of the wild raspberry, scattered in small black spots. *Dulaw Dean.* Aut.

Often intermixed with an orange-coloured *Uredo*.

4. *P. Potentillæ*, capsules cylindrical, 4 or 5-celled, obtuse, brown, on a hyaline filiform stalk.—*GREV.* *Crypt. Fl.* t. 57; *Fl. Edin.* 428. *P. Fragariæ*, *PERT.* *Mid. Fl.* iii. 304.

Hab. On the strawberry-leaved cinquefoil and wild strawberry.

5. *P. Ulmaria*, capsules short, variable, very obtuse, 2 or 3-celled, frequently also divided perpendicularly, on a short slender stalk.—GREV. *Fl. Edin.* 433. *P. Spirea*, PURT. *Mid. Fl.* iii. 304.

Hab. On the leaves of the meadowsweet, rare. Aut.

* * *Capsules 2-celled.*

6. *P. Lichnidearum*, clusters reddish-brown, roundish, compact solitary or arranged concentrically, seldom confluent; capsules on a long stalk, subcylindrical, constricted at the septum, the upper cell somewhat attenuated at the apex.—LINK in WILD. vi. ii. 80. *Bot. Gall.* ii. 887.

Hab. On the leaves of the red campion, occasionally.

7. *P. Circea*, tufts compact, brown, small, collected into circular clusters; capsules small, cylindrical, with a rather long capillary stalk.—HOOK. *Scot.* ii. 17. GREV. *Fl. Edin.* 429.

Hab. On the leaves of enchanter's-nightshade. Dean at the Pease Bridge. Aut.

8. *P. Scorodonia*, tufts minute, collected into circular, compact, rather large thickened spots of a rusty-brown colour; capsules on a longish stalk, obtuse, the cells equal.—LINK in WILD. vi. ii. 72. *Bot. Gall.* ii. 888.

Hab. On the under surface of the leaves of the wood-sage, plentiful.

9. *P. Veronicarum*, tufts minute, compact, collected into brown circular clusters; capsules hyaline, elliptical, thickened at the base, shortly stalked. DECAND. *Fl. Franc.* ii. 594. LINK in WILD. vi. ii. 71. *Bot. Gall.* ii. 889.

Hab. On the under surface of the leaves of the germander speedwell. Dean below the Pease Bridge. Aut.

10. *P. glomerata*, tufts minute, circinate becoming confluent, collected into roundish black clusters on a pale base; capsules shortly stalked, ovate.—GREV. *Fl. Edin.* 433.

Hab. On the under side of the leaves of ragwort, not common.

11. *P. Menthæ*, capsules on a filiform stalk, ovate, very obtuse, collected into small round dark brown spots, scattered on the leaf, or sometimes arranged circularly.—HOOK. *Scot.* ii. 17. GREV. *Fl. Edin.* 430.

Hab. On the under side of the leaves of wild mint, the opposite surface spotted with yellow. Autumn.

12. *P. Aviculariæ*, capsules brown, ovate, short, on a long pelucid slightly incurved stalk, collected into dark brown linear or subcircular spots.—GREV. *Fl. Edin.* 429. HOOK. *Scot.* ii. 17.

Hab. On the stems and leaves of the common knot-grass.

The upper cell of the capsule is small, and the septum rather obscure. The stalk is often inflated towards the base.

13. *P. Graminis*, capsules clavate, rather large, tapering into a filiform stalk, collected into black linear spots margined with the ruptured epidermis.—HOOK. *Scot.* ii. 17. GREV. *Fl. Edin.* 433. LOUD. *Encyclop.* No. 16710. *Uredo Frumenti*, Sow. *Fung.* t. 140.

Hab. On the culms and sheaths of grasses, frequent.

14. *P. arundinacea*, capsules oblong, much contracted at the septum, on a long filiform stalk, collected into linear-oblong compact brown spots.—BOT. *Gall.* ii. 889. *P. graminis*, var. *arundinis*, GREV. *Fl. Edin.* 433.

Hab. On the leaves and sheaths of reeds.

15. *P. Polygoni*, capsules ovate, the upper cell thick, globose, the lower one long and narrow, on a short stalk, and collected into minute round dark brown spots.—GREV. *Fl. Edin.* 430. HOOK. *Scot.* ii. 17.

Hab. On the under surface of the leaves of *Polygonum amphibium*, var. *terrestre*. Autumn.

“*Uredo Polygonorum* is very commonly found along with the Puccinia, and the latter is then frequently arranged in a circular manner round the former.”—GREVILLE.

16. *P. compositarum*, capsules on a short thickish pellucid stalk, ovate or pear-shaped, obtuse, brown, equally 2-celled, collected into small almost black spots scattered on both surfaces of the leaf, and encircled by the ruptured epidermis.—LINK *ut sup.* 73. *Bot. Gall.* ii. 890. *P. Centaureæ*, GREV. *Fl. Edin.* 430.

Hab. On the leaves of black knapweed, not common. Aut.

17. *P. umbelliferarum*, capsules ovate or subglobular, obtuse at both ends, not constricted at the septum, on a very short stalk, collected into small circular almost black spots scattered widely on the leaf.—GREV. *Fl. Edin.* 430.

Hab. On the leaves of umbelliferous plants. On the hemlock, but rather rare.

18. *P. Galii-cruciatae*, capsules shortly stalked, rather long, pear-shaped, often constricted at the septum, collected into small circular scattered blackish-brown spots.—*Bot. Gall.* ii. 890. *P. Valantiae*, GREV. *Fl. Edin.* 432.

Hab. On leaves of the cross-wort, rare. Aut.

19. *P. Calthæ*, capsules on a short stalk, oblong or pear-shaped, very obtuse, contracted at the septum, collected into small scattered dark brown spots.—LINK in WILLD. vi. ii. 79. *Bot. Gall.* ii. 891.

Hab. On the leaves of marsh marygold, rare. Coldingham Moor.

20. *P. Violæ*, capsules very shortly stalked, ovate, obtuse, collected into small scattered blackish-brown spots.—GREV. *Fl. Edin.* 432.

Hab. On the leaves of the dog violet.

Resembles the uredo of the same plant, but is much rarer.

21. *P. variabilis*, capsules nearly sessile, ovate, obtuse, collected into small scattered circular or oblong dark brown spots.—GREV. *Crypt. Fl.* t. 75; *Fl. Edin.* 431.

Hab. On the leaves of dandelion. Aut.

Receives its specific name from the variableness of the capsules in their shape, as is well represented in GREVILLE'S

figure. The little clusters infest both sides of the leaf, and are seated on a pale spot, or encircled by a yellow halo.

22. *P. syngenesarum*, capsules very shortly stalked, ovate, collected in oval blackish-brown raised spots, either covered by the epidermis, or immersed in a circle formed by its rupture.—LINK in WILD. vi. ii. 74.

Hab. On the leaves of thistles, and of the goat's-beard.

23. *P. bullaria*, capsules ovate with equal cells, very shortly stalked, collected into small oblong swollen dark brown spots, covered by the smooth epidermis.—LINK, *ut sup.* 78. *Bullaria umbelliferarum*, Bot. Gall. ii. 886.

Hab. On the stem of the hemlock in autumn, very common.

24. *P. Fabæ*, capsules ovate-globose, 1-celled, on a rather long stalk, collected into minute circular or oblong spots, compact and surrounded by the ruptured epidermis.—GREV. *Crypt. Fl.* t. 29. *P. globosa*, GREV. *Fl. Edin.* 434. *Uredo appendiculata*, Bot. Gall. ii. 897.

Hab. On the leaves of the heath pea (*Orobus tuberosus*), in autumn. Dulaw Dean.

Notwithstanding the capsules are only 1-celled, this is decidedly a *Puccinia* in habit and other characters.

108. UREDO.

* *Colour white.*

1. *U. candida*, in large irregular or sometimes circular chalk-white spots; capsules globular, pellucid—HOOK. *Scot.* ii. 15. GREV. *Fl. Edin.* 442. *Crypt. Fl.* t. 251. *U. Thlaspi*, Sow. *Fung.* t. 340.

Hab. On the leaves and stems of various Cruciform and Syngenesious plants, which, when infested with it, appear as if they had been daubed with whitening.

I have observed this parasite to assume occasionally a very beautiful purple colour. When on the common scurvy

grass, the spots are of a less pure white than on other plants.

* * Colour yellow or orange.

2. *U. Pyrolæ*, spots small, circular, depressed, orange-yellow, closely scattered over the leaf, sometimes clustered; capsules ovate or oblong.—GREV. *Fl. Edin.* 440.

Hab. On the inferior surface of the leaves of *Pyrola minor*, abundant.

3. *U. linearis*, spots oblong or linear, yellow, following the nerves of the leaf, and sometimes forming long lines; capsules oval.—HOOK. *Scot.* ii. 15. GREV. *Fl. Edin.* 440.

Hab. On the leaves of corn and grasses, very common, infesting both sides, and producing the disease called *Rust*.

4. *U. ovata*, spots small, irregular or confluent, orange-yellow, scattered; capsules ovate.—GREV. *Fl. Edin.* 442.

Hab. On the leaves of the birch, very common.

5. *U. Senecionis*, spots orange-yellow, irregular, becoming confluent, scattered over the lower surface.—GREV. *Fl. Edin.* 438.

Hab. On the leaves of groundsel (*Senecio vulgaris et sylvaticus*), frequent.

6. *U. Tussilaginis*, spots bright reddish-orange, crowded, generally forming circles; capsules subovate.—GREV. *Fl. Edin.* 437.

Hab. On the leaves of coltsfoot, principally in autumn.

7. *U. Sonchi*, spots scattered thickly over the leaf, small, circular or irregular, red, rich yellow or brownish yellow; capsules ovate.—PERT. *Mid. Fl.* iii. 299. GREV. *Fl. Edin.* 441.

Hab. On sow thistles (*Sonchus arvensis et oleraceus*), very common.

8. *U. Petasitis*, spots orange coloured, minute, irregular becoming confluent; capsules oval.—GREV. *Fl. Edin.* 441.

Hab. On the under surface of the large leaves of the butter bur, common.

When preserved for some time in the herbarium the colour fades, a change which happens to many others of the yellow Uredines.

9. *U. Rosæ*, spots minute, rusty yellow, thickly scattered over the lower surface; capsules suboval.—GREV. *Fl. Edin.* 438.

Hab. On the leaves of the wild dog rose, but more common on those of garden roses.

10. *U. effusa*, spots bright reddish-orange, large, irregular, very pulverulent; capsules subglobose.—GREV. *Crypt. Fl.* t. 19.; *Fl. Edin.* 439. *U. aurea*, PURT. *Mid. Fl.* ii. 725.

Hab. On the leaves, veins, flower-stalks, and seed-vessels of the burnet and dog roses, and on the meadowsweet, common.

11. *U. Ruborum*, spots golden-yellow, subcircular, becoming effused; capsules irregularly spherical.—GREV. *Fl. Edin.* 438.

Hab. On the leaves of brambles, common.

12. *U. Potentillæ*, spots golden-yellow, scattered, irregular, becoming confluent; capsules subspherical.—GREV. *Fl. Edin.* 438. *U. Fragariæ*, PURT. *Mid. Fl.* iii. 299.

Hab. On *Potentilla fragaria*, frequent; and on *Agrimonia eupatoria*.

13. *U. Alchemillæ*, spots fine orange colour, linear-oblong, arranged in a subparallel manner, becoming confluent; capsules spherical.—GREV. *Fl. Edin.* 439.

Hab. On the under surface of small or young leaves of lady's-mantle, frequent.

14. *U. caryophyllacearum*, spots small, oblong, orange-yellow, scattered, covered by the thin epidermis; capsules oval.—LINK, in WILD. vi. ii. 26.

Hab. On the leaves of *Stellaria graminea* and *Cerastium viscosum* in autumn, not common.

15. *U. vacciniorum*, spots minute, orange-yellow, round, scattered; capsules very small, globular or ovate, often stalked.—*Cæoma vacciniorum*, LINK, *sup. cit.* 15.

Hab. On the under side of the leaves of *Vaccinium Myrtillus*.

16. *U. Campanulæ*, spots yellowish-orange, round, depressed, scattered, rarely confluent, surrounded by the remains of the ruptured epidermis; capsules spherical.—GREV. *Fl. Edin.* 440.

Hab. On the leaves of *Campanula rotundifolia*, not common.

17. *U. rhinanthacearum*, spots small, oblong, orange-yellow, scattered or confluent; capsules spherical.—GREV. *Fl. Edin.* 439.

Hab. On the leaves and calyces of the eye-bright, red bartsia, and yellow rattle, very common.

18. *U. populina*, orange-yellow, thickly scattered, bursting the epidermis in roundish spots; capsules cylindrical, long, obtuse at each end.—GREV. *Fl. Edin.* 442. *U. longicapsula*, *Bot. Gall.* ii. 895.

On the under side of the leaves of the balsam poplar in autumn, abundant.

19. *U. vitellinæ*, spots scattered over the lower surface, small, yellow, distinct; capsules very minute, globular, transparent.—GREV. *Fl. Edin.* 437.

Hab. On the leaves of the common osier in autumn.

20. *U. farinosa*, ochrey-yellow, oval or roundish, soon becoming confluent so as to cover the leaf entirely or in patches, very pulverulent; capsules oval, pellucid.—GREV. *Fl. Edin.* 437. *PURT. Mid. Fl.* iii. 298.

Hab. On the leaves of willows (*Salix caprea et aurita*), confined to the lower surface; and on the fertile catkins of *Salix prostrata*.

21. *U. Gnaphalii*, spots scattered, irregular, minute, pale yellow; capsules minute, globular, pellucid.

Hab. On the under surface of the leaves of *Gnaphalium germanicum*, almost concealed by the woolliness of the part.

*** Colour brown.

22. *U. Epilobii*, spots small, widely scattered, dark brown, sur-

rounded by the ruptured epidermis; capsules subglobular or ovate, brownish, pellucid.—*Bot. Gall.* ii. 896.

Hab. On the leaves of *Epilobium montanum*, rare.

23. *U. Cichoracearum*, spots minute, dark brown, thickly scattered over the inferior surface; capsules globular, sometimes stalked.—GREV. *Fl. Edin.* 435.

Hab. On the leaves of the nipple-wort and dandelion, common.

24. *U. intrusa*, spots small, rich brown, pulverulent, scattered over the inferior surface, at first encircled by the ruptured epidermis; capsules roundish or oval.—GREV. *Fl. Edin.* 436.

Hab. On the leaves of lady's mantle in summer.

25. *U. Geranii*, spots dark brown, small, scattered, very pulverulent; capsules globose.—GREV. *Crypt. Fl.* t. 8; *Fl. Edin.* 434.

Hab. On the leaves of the wood and meadow crane's-bill, common.

“It is a rich coloured plant, particularly when its dark pulverulent spots occur on a leaf yellow from the first stage of decay.”—GREV. I have seen what I suppose to be the same species on the leaves of the musk mallow.

26. *U. Polygonorum*, spots small, circular, brown, numerous, scattered, encircled by the ruptured epidermis; capsules globose, some stalked.—GREV. *Crypt. Fl.* t. 80; *Fl. Edin.* 434.

Hab. On the leaves of *P. aviculare* and *amphibium*.

27. *U. bifrons*, spots scattered, round, light brown, girt with the remains of the epidermis, seated on both sides of the leaf, and opposite to each other; capsules globose.—GREV. *Fl. Edin.* 435.

Hab. On the sorrel, rare.

28. *U. Rumicum*, spots circular, minute, brown, on both surfaces of the leaf, and often not bursting the epidermis; capsules ovate, sometimes with minute pedicels.—PURT. *Mid. Fl.* iii. 297. GREV. *Fl. Edin.* 436.

Hab. On the leaves of docks, frequent.

The infected leaves are often irregularly spotted with pale yellow.

29. *U. umbellatarum*, spots scattered, small, subcircular or oval, yellowish-brown; capsules ovate, pellucid, sometimes stalked.—*Cæoma umbellatarum*, LINK in WILD. vi. ii. 23. *Uredo Cynapii*, Bot. Gall. ii. 900.

Hab. On the under surface of hemlock leaves, abundant.

The *Uredo Heraclei* of GREVILLE is probably identical with this species.

30. *U. Violarum*, spots small, subcircular, brown, thickly scattered on the leaf; capsules globular, shortly pedicled.—DECAND. *Fl. Franc.* vi. 73. Bot. Gall. ii. 899.

Hab. On the dog's violet, attacking both sides of the leaf.

31. *U. suaveolens*, brown, the spots at first scattered, circular, very numerous, becoming confluent and covering the whole leaf; capsules globose.—HOOK. *Scot.* ii. 15. GREV. *Fl. Edin.* 434. *Æcidium Cardui*, Sow. *Fung.* t. 398. f. 5.

Hab. On the leaves of the creeping and marsh thistles, common.

This species attacks both surfaces of the leaf, but principally the under, which it covers with crowded powdery spots, small, distinct and yellowish at first, but becoming more or less confluent in its progress, and of a dark brown colour. It exhales a strong sweet honey-like smell, perceptible, however, only in the first stages of the plant. The following remark of SOWERBY is consistent with my own observation: "Two or three sorts of flies are occasionally found dead on this plant (creeping thistle) at the time of the *Æcidium* being upon it, which is after wet weather in the summer, or early in autumn: being apparently tempted by its flavour, they over-eat themselves, or else are destroyed by some poison."

32. *U. oblongata*, spots oblong, reddish brown, bursting through the epidermis longitudinally; capsules subglobular.—GREV. *Crypt. Fl.* t. 12; *Fl. Edin.* 437.

Hab. On the leaves of the great wood-rush.

The spots are surrounded by a reddish-crimson halo. This

change of colour frequently happens when there is no evident uredo, probably the result of an imperfect evolution.—GREVILLE.

33. *M. Labiatarum*, spots small, circular, dark brown, scattered, encircled by the ruptured epidermis; capsules globular, brown, minutely pedicled.—HOOK. *Scot.* ii. 15. GREV. *Fl. Edin.* 436.

Hab. On the leaves of *Ajuga reptans* in autumn.

34. *U. Ficiaræ*, spots very dark brown, rather large, pulverulent; raised; capsules oval.—GREV. *Fl. Edin.* 434.

Hab. On leaves of pilewort in woods, not uncommon.

**** Colour black.

35. *U. segetum*, within the fruit and glumes of corn and grasses, spreading, and in a short time filling the whole with a profuse black scentless dust; capsules minute, spherical.—HOOK. *Scot.* ii. 15. GREV. *Fl. Edin.* 443. *U. carbo.* *Bot. Gall.* ii. 901.

Hab. Grains of wheat, oats, and barley.

This is, I believe, the *Black-ball* of farmers. The injury it does to the crops, although estimated to be very considerable by botanists, is in reality very trifling; and the disease can be almost entirely prevented by proper pickling.

LINNÆUS at one time was inclined to believe in the animal nature of the fungi, and he seems to have been led to this opinion by some observations on *Uredo segetum*. "With regard to fungi," he writes to Ellis, "you may pick up, in most barns or stacks of corn, spikes of wheat or barley, full of black powder, which we call *ustilago*, or smut. Shake out some of this powder, and put it into tepid water, about the warmth of a pond in summer, for three or four days. This water, though pellucid, when examined in a concave glass under your own microscope, will be found to contain thousands of little worms. These ought first to be observed, to prevent ocular deception. In mould, *Mucor*, you will find the same, but not so easily as in the large fungi. If, in the course of from 8 to 14 days, the water has been kept up to the same temperature, you may observe how these minute worm-like bodies become fixed, one after the other, and acquire roots."—LINN. *Corresp.* 1767. This is very much like the process which has been observed in the growth of some *Confervæ*, and which has given origin to

speculations of the vaguest kind relative to the metamorphosis of vegetables into animals, and of these again into plants!

36. *U. caries*, always inclosed within the grain, and filling it with a uniform, dense, foetid, blackish-brown mass composed of minute spherical capsules.—HOOK. *Scot.* ii. 16. GREV. *Fl. Edin.* 443.

Hab. Within the grains of wheat.

The *Smut* of the agriculturist. Unlike the preceding, this never appears externally, so that some farmers remain ignorant of its existence in the corn, until it passes through the thrashing-mill, when the fetid smell immediately discloses the injury. Those who know the fungus can discover the diseased heads by a difference in their colour so slight that it escapes the eye of the botanist. The *Uredo* renders the grain more swollen and turgid; and on bruising it, we find it filled with a black powder, of a very disagreeable smell. In some years this disease is productive of considerable loss to the farmer, and is less under the preventive influence of the pickle than the *Uredo segetum*.

37. *U. urceolarum*, attacking the fruit of Carices, and forming a black compact slightly pulverulent mass, composed of a pale solid nucleus, surrounded by the naked capsules, which are small and globular.—GREV. *Fl. Edin.* 443.

Hab. The fruit of Carices (*C. præcox*, *stellulata et recurva*), not uncommon.

38. *U. flosculorum*, capsules very minute, purplish-brown, plentiful, produced within the florets, and often filling them with a pulverulent mass.—GREV. *Fl. Edin.* 443. *Farinaria scabiosa*, Sow. *Fung.* t. 396, f. 2.

Hab. The flowers of the field-scabious, rare.

109. ÆCIDIUM.

1. *Æ. Epilobii*, scattered over the whole leaf, distinct, numerous, cup-like; margin of the cover raised, white, with revolute teeth; disk orange-coloured.—GREV. *Fl. Edin.* 444.

Hab. On the under side of the leaves of *Epilobium montanum*.

2. *Æ. Cichoracearum*, scattered over the whole leaf, distinct, numerous, the cover circular or oval, white, raised, with an inflected torn margin; disk orange-coloured.—DECAND. *Fl. Franc.* ii. 239. *Æ. Tragopogi*, PERS. *Syn.* 211. MOUG. and NEST. No. 388.

Hab. On the stems, leaves, and involucre of the yellow goat's-beard.

3. *Æ. Sonchi*, minute, scattered, whitish or cream-coloured, prominent; granules ovate, rather large.

Hab. On the under surface of the leaves of *Sonchus arvensis* in autumn.

The cover does not split so regularly, and is not so decidedly cupped as is common in this genus.

4. *Æ. Violarum*, scattered or somewhat clustered; margin of the cover whitish, raised, with everted obtuse teeth; disk orange-coloured.—GREV. *Fl. Edin.* 444.

Hab. Grows on the leaves of dog's violet in circular patches, and in a diffused manner on the footstalks.

5. *Æ. albescens*, scattered on an irregular white even stain of the leaf; cover whitish, raised, with a circular toothed aperture; disk orange.—GREV. *Fl. Edin.* 444.

Hab. On the leaves and stalks of *Adoxa moschatellina*.

6. *Æ. confertum*, clustered on a pale stain of the leaf; cover raised, white, with a circular toothed aperture; disk orange-yellow.—GREV. *Fl. Edin.* 446.

Hab. On the leaves of pilewort in woods.

7. *Æ. Geranii*, irregularly clustered on a thickened base, orange-yellow, hemispherical, with a subdenticulate erect margin formed by the swollen and ruptured cover; granules minute, globular.—DECAND. *Fl. Franc.* vi. 93. *Uredo hemisphærica*, SPRENG. *Syst.* iv. 571.

Hab. On the nerves of the leaves of *Geranium pratense*, rare.

8. *Æ. Taraxaci*, spots clustered on a slightly thickened base,

scattered over the leaf; cover white, with a raised circular finely toothed aperture; disk orange.—GREV. *Fl. Edin.* 444.

Hab. On the leaves of the dandelion, not common.

On the leaves of the *Leontodon Taraxacum*, the clusters are small, and there are many on the same leaf; on *L. palustre* the clusters are few, much larger, and surrounded by a purple halo.

9. *Æ. Periclymeni*, spots clustered on a thickened subcircular base; cover prominent, whitish, with a toothed orifice; disk fine orange or dark red.—GREV. *Fl. Edin.* 445.

Hab. On the leaves of the honeysuckle, generally on the under surface, but I have seen it on the upper also.

10. *Æ. Prenanthes*, spots in circular or irregular patches, on a very slightly thickened base surrounded with a purplish halo; cover white, the margin irregularly torn; disk pale yellow.—GREV. *Fl. Edin.* 445.

Hab. On the leaves of hawkweed (*Hieracium paludosum*).

11. *Æ. Urticæ*, spots clustered on a much thickened base; cover campanulate, with a numerously toothed circular aperture; disk yellow.—GREV. *Fl. Edin.* 445. PURT. *Mid. Fl.* iii. 294.

Hab. On the leaves and stems of the nettle, distorting them much, frequent.

12. *Æ. Grossulariæ*, spots clustered on a much thickened red base of a subcircular form; cover raised, with a circular toothed aperture; disk orange.—GREV. *Fl. Edin.* 446; *Crypt. Fl.* t. 62.

Hab. On the leaves and young fruit of the gooseberry, common.

13. *Æ. Ranunculacearum*, spots collected into irregular thickened clusters; cover whitish, with a circular toothed aperture; disk orange-yellow.—GREV. *Fl. Edin.* 446.

Hab. On the leaves of the crowfoots (*Ranunculus acris* et *repens*), not common.

14. *Æ. Valerianearum*, spots on a thickened subcircular or oblong base; cover whitish, with a circular cupped lacerate mouth; disk orange red; capsules globular.—BOT. GALL. ii. 908.

Hab. On the under surface of the leaves, and on the foot-stalks of the valerians (*Val. officinalis* et *dioica*), not uncommon.

15. *Æ. Berberidis*, spots collected into subcircular clusters with a thickened red base; cover cylindrical, elongate, with a circular aperture; disk orange.—GREV. *Crypt. Fl.* t. 97; *Fl. Edin.* 446. HOOK. *Scot.* ii. 14.

Hab. On the leaves of the barberry, frequent.

16. *Æ. Tussilaginis*, collected into round thickened clusters, the spots arranged somewhat circularly; cover whitish, short, with a toothed aperture; disk reddish-orange.—HOOK. *Scot.* ii. 14. GREV. *Fl. Edin.* 447.

Hab. On the under surface of leaves of colt's-foot, very common, from spring to autumn.

17. *Æ. Allii*, spots arranged in concentric circles on a pale spot of the leaf, not thickened, small, with a whitish circular toothed aperture; disk yellowish.—GREV. *Fl. Edin.* 447.

Hab. On both surfaces of the leaf of broad-leaved garlic (*A. ursinum*). In the dean below Dulaw, Berwickshire.

18. *Æ. cornutum*, clustered on an orange-coloured thickened spot, the cover forming long, curved, cylindrical tubes of a pale brown.—HOOK. *Scot.* ii. 14. GREV. *Fl. Edin.* 447; *Crypt. Fl.* t. 180.

Hab. On the under surface of the leaves of the roan-tree, in autumn. Houndswood.

This curious species is often imperfectly developed, nothing appearing on the leaf but a thickened brown spot.

19. *Æ. laceratum*, densely aggregated; cover elongated, sub-immersed, pale brown, irregularly torn.—GREV. *Fl. Edin.* 447. *Crypt. Fl.* t. 209.

Hab. On the nerves and petiols of the leaf, and on the fruit of the hawthorn, not common in this neighbourhood. My specimen is from Elmford, Berwickshire.

The circumstances which determine the choice are unknown, but while some plants are annually much infested with *Æcidia*, others are invariably exempted from their attacks.

The gooseberry is of the former class, the red and black currants of the latter; and I adduce these examples because the plants belong to one genus, and are cultivated in the same soil and situations. *Æcidia*, on the whole, however, seem to prefer such plants as leaf and flower in spring or early summer. They attack them while in health and vigour; and if the parasites sometimes distort the lineaments and fair proportions of their supporters, they yet more frequently invest them with ornament and additional interest.

110. ERINEUM.

1. *E. pyrinum*, scattered, subeffused, rich reddish-brown; filaments compressed, linear, somewhat lax, with the apex club-shaped, and often truncate.—*PERT. Mid. Fl.* iii. 315. *GREV. Fl. Edin.* 449.; *Crypt. Fl.* t. 22.

Hab. On the under surface of the leaves of the crab-tree, very rare. I have twice met with it; once in the immediate vicinity of Berwick, and once near Mountfair, Berwickshire.

2. *E. acerinum*, distinct or confluent, pale buff, becoming reddish-brown; filaments club-shaped, very rarely turbinate, flaccid, the upper half often inclined.—*GREV. Fl. Edin.* 449. *HOOK. Scot.* ii. 34. *PERT. Mid. Fl.* iii. 313. t. 36.

Hab. On the leaves of the plane or sycamore, in circumscribed spots, or covering the whole under surface, common.

3. *E. fagineum*, spots somewhat immersed, dense, at first white, at length rich brown; filaments clavate, turbinate.—*GREV. Crypt. Fl.* t. 250. f. 1.

Hab. On the under surface of the leaves of the beech, in spots often bounded by the nerves of the leaf. Black-adder plantations. Woods at the Pease-bridge.

4. *E. betulinum*, spots white, at last becoming of a dark brown, often confluent; filaments short, polymorphous, sometimes turbinate, but generally with 2 blunt horn-like patent summits.—*GREV. Fl. Edin.* 451. *HOOK. Scot.* ii. 34.

Hab. On the leaves of the birch, frequent.

5. *E. populinum*, immersed in deep hollows of the leaf, at first pale, then reddish, at length dark purplish-brown; filaments opaque, thick, irregular, somewhat divided and erose at the summit.—GREV. *Crypt. Fl.* t. 250. f. 2. PURT. *Mid. Fl.* iii. 315.

Hab. On the leaves of poplars near Berwick.

6. *E. alneum*, spots effused, irregular, orange-brown; filaments short, pellucid, divided at the top into short, subglobose, irregular lobes.—HOOK. *Scot.* ii. 34. GREV. *Fl. Edin.* 451.

Hab. On the under surface of alder leaves, not common.

111. FUSIDIUM.

1. *F. flavo-virens*, mass irregular, thin, bright yellow or greenish.—GREV. *Fl. Edin.* 464.; *Crypt. Fl.* t. 102. f. 2.

Hab. On dead beech leaves. From Dunglass Dean, Rev. A. Baird.

112. SEPEDONIUM.

1. *S. mycophilum*, bright orange, occupying the interior of dying fungi; capsules exceedingly copious, globular, minute, mixed with a few slender branched filaments.—GREV. *Fl. Edin.* 466.; *Crypt. Fl.* t. 198. *Mucor chrysospermus*, Sow. *Fung.* t. 378. WITH. iv. 439.

Hab. In decaying fungi, chiefly boleti. On a boletus near Langton, pointed out to me by Mr Thomas Brown.

The powder of this production is immiscible with water, and has properties similar to that of the *Lycoperda*. In a natural arrangement the genus ought to stand close to *Lycogola*.

113. CLADOSPORIUM.

1. *C. herbarum*, blackish-green, short, velvet-like, tufted or effused; filaments rigid, opaque, erect, irregularly and sparingly branched.—GREV. *Fl. Edin.* 469. LINK in WILD. vi. 1. 39. *Bot. Gall.* ii. 930.

Hab. On the stems of umbelliferous plants; on the under surface of dead oak leaves; and on dried agarics.

114. TORULA.

1. *T. herbarum*, filaments very short, densely crowded, so as to form a broad black velvet-like crust.—GREV. *Fl. Edin.* 469. *Bot. Gall.* ii. 931.

Hab. On dead stems of herbaceous plants, near their base.

The filaments are very distinctly jointed under the microscope, rigid, straight, and simple.

115. ACROSPORIUM.

1. *A. monilioides*, filaments very short and tender, erect, simple, loosely tufted, white or yellowish; joints oval, pellucid.—GREV. *Crypt. Fl.* t. 73.; *Fl. Edin.* 469. *Oidium monilioides*, *Bot. Gall.* ii. 932.

Hab. On the living leaves of grasses, especially of *Holcus lanatus*, in spring, frequent.

Forms irregular pulverulent spots of a white or greyish colour, and the microscope is necessary to discover the filamentous structure. The joints in Dr GREVILLE'S figure are represented more globular than they really are.

116. MUCOR.

1. *M. caninus*, filaments tufted, erect, simple, white, each tipped with a minute amber coloured or brown globular head.—GREV. *Crypt. Fl.* t. 305.

Hab. On swine's and dog's dung. Early spring.

A beautiful kind of mould, covering the substances on which it grows with a hoary beard. Filaments $\frac{1}{2}$ inch high, pellucid, unjointed, tubular; capsules when young of an amber colour, but becoming darker or even brown when mature. If wetted with a drop of water, they instantly burst and discharge a cloud of pellucid ovate granules, so numerous, and comparatively so large, that we wonder in what manner they had been packed within so small a globe. Some of the granules are likewise projected down the tube of the stalk, as I once very distinctly witnessed. The immature capsules are not affected by moisture.

2. *M. mucedo*, filaments crowded, mould-like, simple, pellucid,

the little heads spherical, at first whitish but at length dark grey.—HOOK. *Scot.* ii. 13. *M. ascophorus*, *Bot. Gall.* ii. 914. *Ascophora mucedo*, GREV. *Fl. Edin.* 448.; *Crypt. Fl.* t. 269.

Hab. On bread, paste, melted butter, &c. when kept.

A very common sort of mould, and often productive of injury to articles of daily use. It may, therefore, be useful to know, that mouldiness may be prevented in almost any article by the application of perfumes, such as those of the essential oils, cloves, pepper, turpentine, &c.—Dr MACCULLOCH in *Edin. Phil. Journ.* viii. 34.

117. ASPERGILLUS.

1. *A. glaucus*, filaments erect, simple, terminated with a globular head of spherical granules, at first white, but when mature of a greyish-green.—GREV. *Fl. Edin.* 467.

Hab. On various putrefying and damp substances, as fruit, bread, cheese, &c.; also infesting plants while drying for the herbarium if not regularly changed.

This is the plant so well known by the name of blue mould, and there is much interest in its history. At first some white cobweb-like filaments spread over the substance of the infected substance, whence sprouts up a thick forest of other filaments about $\frac{1}{8}$ th of an inch in height, pellucid, tubular, and obscurely marked with one or two joints. Each filament is terminated with a globe, minute indeed to our enlarged vision, but large and heavy when compared with the slender stalk which supports it. This globe is entirely composed of pellucid grains, uncovered by any membrane, yet closely compacted; and if unravelled with a little care, they will be found to be, occasionally at least, arranged in beaded lines of perfect uniformity.

118. PENICILLIUM.

1. *P. glaucum*, effused, flocculent, greyish-blue; filaments pellucid, decumbent and erect, the latter with a cluster of very short branches at the top, loaded with minute globular capsules.—GREV. *Crypt. Fl.* t. 58. f. 1.; *Fl. Edin.* 467.

Hab. On decaying agarics, in dense irregular mouldy spots about 1 line high, common.

Before maturity this mould is white.

119. BOTRYTIS.

1. *B. agaricina*, pure white, flocculent; filaments erect, pellucid, tubular, scarcely jointed, irregularly branched; branches spreading, loaded with innumerable pellucid globular capsules, unattached by any pedicle, and without any particular arrangement.—LINK in WILD. vi. 1. 54. LOUD. *Encyclop.* No. 16579.

Hab. Parasitical on *Uredo candida* in autumn, covering it with a snow-white wool about 1 line in height.

2. *B. cinerea*, tufted, flocculent, erect, smoky-grey; filaments tubular, jointed, sparingly and irregularly branched; branches spreading; capsules subglobular, minute, chiefly attached about the summits of the filaments.—LINK in WILD. vi. 1. 60.

Hab. Parasitical on *Sclerotium durum* in early spring.

So much like a small tuft of stained wool, that it may be passed by as such. It forms a tuft about $\frac{1}{2}$ inch in height, sprinkled over with a greyish dust, formed of the capsules. The joints are long, irregular, and when dry many of them are alternately collapsed.

120. RACODIUM.

1. *R. cellare*, filaments areneous, olivaceous, irregularly branched, very slender, opaque, and rather rigid.—HOOK. *Scot.* ii. 34. GREV *Fl. Edin.* 470.; *Crypt. Fl.* t. 259. *Byssus septica*, LIGHTF. *Scot.* 999.

Hab. On casks and timbers in wine cellars, in cobweb-like round tufts when young, more irregular when old.

“If suffered to remain any long time upon the casks, it decays the timber very much. In its last black and soft state it is excellent to staunch blood, perhaps superior even to the celebrated agaric.”—LIGHTFOOT.

121. BYSSUS.

1. *B. floccosa*, tufts roundish, snow-white, very soft; filaments simple, close, parallel.—BOT. *Gall.* ii. 934. DILL. *Musc.* p. 5. t. 1. f. 9.

Hab. Wine cellars, on casks and timbers.

Hangs from the casks and timbers in large tufts, resembling tufts of the finest cotton. It is glutinous, adhering to the fingers when handled, and contains more or less water. The filaments are closely interwoven, and are apt to adhere to one another; they are tubular, and often appear alternately contracted at irregular and remote distances. Dr WITHERING has confounded it with *Racodium cellare*.

122. HIMANTIA.

1. *H. candida*, filaments very fine, white, radiating, dilated at the extremities in a plumose manner.—HOOK. Scot. ii. 35. GREV. Fl. Edin. 470.; Crypt. Fl. t. 228. *Fibrillaria stellata*, Sow. Fung. t. 387. f. 1.

Hab. On dead leaves in woods, very common.

I may here give a description of a production, which, whether a vegetable or not, seems to deserve notice on account of its beauty and singularity. The upper figures on Plate VI. represent this object. It was found growing on decayed branches of hazel, and at least twenty specimens were procured all precisely similar. Originating under the bark, and escaping by some fissure in it, the slender stalk rises for about half an inch, and supports a proportionally large head, which is like a glass bead or an egg in miniature. The stalk, when fully exposed, is about $1\frac{1}{2}$ inch in length, filiform, smooth, hollow, more or less flexuose at the root, and white or brownish. The head or capsule is ivory-white, sometimes tinged with pink, cernuous, ovate, smooth and glossy, tipped with a jet-black lid or operculum, and so hard and compact that it almost rings when dropt on a table. It is densely cellular, and contains in the centre a green oval vesicle, which appears to be formed by a continuation and expansion of the stalk. The vesicle is membranous, and may be with ease entirely removed from the white bed in which it lies. It has no connection with the persistent lid, nor did it contain any fluid or foreign body. It has been suggested by an eminent naturalist, that this production may prove to be the nidus of an insect; while another is of opinion that it is a diseased state of *Bryum capillare*. The latter conjecture is ingenious, but not unattended with difficulties.

ORDER VIII.

ALGÆ.

“ ————— As we strolled along,
 It was our occupation to observe
 Such objects as the waves had tossed ashore,
 Tangle or weed of various hues and forms,
 Each on the other heaped, along the line
 Of the dry wreck. And, in our vacant mood,
 Not seldom did we stop at some clear pool
 Hewn in the rock, and, wrapt in pleasing trance,
 Survey the novel forms that hung its sides,
 Or floated on its surface,—too fair
 Either to be divided from the place
 On which they grew, or to be left alone
 To their own beauty.”

* *Fronde olive-coloured, becoming blackish in drying, coriaceous, fibrous, continuous, branched. Marine.*

123. LICHINA. Frond short, erect, dichotomous, blackish-green; the fructification capsular, terminal or nearly so.

124. FUCUS. Frond dichotomously branched, compressed; air-bladders when present innate in the frond; receptacles granular, turgid, terminal, simple, or sometimes bifid.

125. DESMARESTIA. Frond narrow, linear, compressed, very much branched, the branches and branchlets narrowed at the base, set with marginal spines; receptacles unknown.

126. FURCELLARIA. Frond cylindrical, solid, dichotomous, with

a fibrous root; branches swelling at the ends into pod-like simple receptacles.

127. **HIMANTHALIA.** Frond plane, dichotomous, shooting from a cup-like base; branches linear, elongate, obtuse; air-bladders none; seeds in small innate clusters scattered throughout the frond.

*** Olivaceous, coriaceous, fibrous, continuous, stalked, the stem expanded into a simple or divided leaf. Marine.*

128. **LAMINARIA.** Frond stalked, with a fibrous root, supporting a coriaceous or membranous plane leaf; seeds in small immersed clusters, scattered throughout the expanded frond.

**** Purple, red or rose-coloured, unchanged in drying, coriaceous or membranous, expanded into leaves or a leaf-like frond. Marine.*

129. **HALYMENIA.** Stalk coriaceous, simple, or more or less branched, dilated into a leaf-like divided or simple frond, nerveless, or obsoletely nerved at the base only; clusters either punctiform and immersed, or tubercular, rounded and sessile.

130. **DELESSERIA.** Stalk coriaceous, branched, foliaferous, the leaves nerved with the percurrent branches; fructification of two kinds,—capsules containing a globular mass of seeds, and ternate granules forming definite clusters in the frond or in distinct leaflets.

131. **ODONTHALIA.** Frond plane, between membranaceous and cartilaginous, dark vinous red, with an obsolete midrib, and alternately toothed at the margin; fructification marginal, axillary, or in the teeth—1. capsules containing pear-shaped seeds; 2. slender processes containing ternate granules.

132. **CHONDRUS.** Frond plane, thickish, coriaceous, dichotomously branched, nerveless; receptacles tubercular, hemispherical or oval, scattered on the disk of the frond.

* * * * *Variously coloured, cartilaginous, continuous, much branched ; branches narrow, generally cylindrical. Marine.*

133. **GELIDIUM.** Frond linear, very narrow, plane, nerveless, more or less regularly pinnated; fructification—1. capsules imbedded in the substance of the branchlets containing a mass of minute roundish seeds; 2. ternate or otherwise compound granules in the branchlets, on distinct individuals.
134. **LAURENCIA.** Frond narrow, cylindrical or compressed, between cartilaginous and gelatinous, irregularly branched; fructification—1. ovate capsules, containing a cluster of pear-shaped seeds fixed by their base; 2. ternate granules imbedded in the branchlets.
135. **PLOCAMIMUM.** Frond compressed, very narrow, cartilaginous, much branched; branches spreading, the external ones pectinate; fructification—1. granules imbedded in the branchlets; 2. spherical lateral capsules.
136. **LOMENTARIA.** Frond tubular, subgelatinous, round or compressed, and often contracted at intervals as if jointed, much branched; fructification—1. spherical, ovate, or conical capsules; 2. imbedded ternate granules.
137. **POLYIDES.** Frond cylindrical, cartilaginous and solid, branched, the branches fastigate; fructification—naked spongy warts composed of radiating filaments, among which the seeds are imbedded.
138. **GIGARTINA.** Frond cylindrical, filiform, subcartilaginous, continuous, much branched; fructification—1. spherical sessile capsules; 2. tubercles imbedded in the branchlets.
139. **RHODOMELA.** Frond cylindrical, filiform, much branched, coriaceo-cartilaginous; fructification—1. subglobose capsules, containing free pear-shaped seeds; 2. pod-like receptacles with imbedded ternate granules.

***** *Red or olive-coloured, capillary, much branched, the branches jointed with distinct and regular partitions.*

+ *Plants of a red colour.*

140. **ASPEROCAULON.** Frond much branched, the main stem opaque, hirsute, inarticulate; branches jointed; fructification double—capsules and lanceolate pods containing rows of granules.
141. **POLYSIPHONIA.** Filaments jointed, longitudinally striated with internal parallel tubes; fructification double—ovate capsules and granules in swollen branchlets.
142. **CERAMIUM.** Filaments jointed, dichotomous, red; articulations veined or diaphanous; fructification—capsules with an involucre of short ramuli, and imbedded granules in the summits of the branches.
143. **CALLITHAMNION.** Filaments jointed, rose-red, branched; articulations marked with one broad tube-like line, the joints pellucid; fructification—pedunculated capsules on the ramuli.
144. **GRIFFITHSIA.** Filaments jointed, fine red, branched; fructification—granules surrounded with a gelatinous border, and protected by a filamentous involucre.
145. **TRENTEPOHLIA.** Filaments jointed, flexible, orange-coloured or pale red, branched, bearing capsules which generally proceed from the last articulation which is inflated. Fluviate.
146. **AMPHICONIUM.** Filaments rigid, nearly solid, opaque, crumbling into powder, torulose. On bark or rocks.

+ + *Olivaceous.*

147. **CLADOSTEPHUS.** Plant branched, the main filaments opaque, inarticulate, the branches jointed, mostly whorled with ramuli; fructification—capsules.

148. **ECTOCARPUS.** Much branched, the filaments jointed, solid, fuscous; fructification—lanceolate pods or ovate capsules, solitary or racemose.

***** *Dark green, capillary, solid and continuous, branched. Fluvatile.*

149. **LEMANEA.** Filaments straight, rigid, somewhat branched, knotted, the knots containing very minute moniliform tufted filaments.

***** *Purple or olivaceous, not changing in drying, cylindrical or filiform, fistular. Marine.*

150. **DICTYOSIPHON.** Frond filiform, tubular, continuous, branched; root minutely scutate, naked; fructification—ovate scattered seeds lying beneath the epidermis.

151. **DUMONTIA.** Frond cylindrical, simple or branched, membranaceous, tubular, gelatinous within, of a red or purplish-red colour; fructification—globules of seeds attached to the inner surface of the membrane of the frond.

152. **CHORDA.** Frond simple, filiform, cylindrical, with an interrupted cavity; root naked, scutate; fructification—external continuous masses of pear-shaped seeds fixed by their base.

153. **ASPEROCOCCUS.** Frond tubular, cylindrical, continuous, membranaceous; root minutely scutate, naked; fructification—distinct spots composed of imbedded seeds mixed with erect club-shaped filaments.

***** *Green, olive-green or purple, thin, membranous, plane or fistular, stemless.*

154. **PUNCTARIA.** Frond simple, membranaceous, flat, with a naked scutate root; fructification scattered over the whole frond in minute distinct spots, composed of roundish prominent seeds intermixed with club-shaped filaments.

155. **ZONARIA.** Frond appressed, plane, subcircular, coriaceous;

the clusters of seeds arranged in concentric lines and immersed.

156. *ULVA*. Frond fistular or plane and expanded, membranous, thin, cellular; seeds in minute innate clusters scattered over the frond.

***** *Green, capillary, branched, unjointed; seeds in capsules.*

157. *VAUCHERIA*. Fronds aggregated, tubular, continuous, capillary, coloured by an internal green pulverulent mass; fructification—dark green homogeneous vesicles attached to the frond.

***** *Green, capillary, filaments jointed.*

158. *CONFERVA*. Filaments uniform, simple or branched, membranaceous; sometimes coloured; fructification—granules scattered in the articulations.
159. *ZYGHEMA*. Filaments simple, elongate, membranaceous, jointed, at length forming lateral unions by short tubes passing from one filament to another; fructification—minute internal granules assuming some determinate form or arrangement.
160. *BATRACHOSPERMUM*. Filaments gelatinous, much branched, jointed; branchlets short, moniliform, placed in whorls at the articulations; fructification—clusters of grains placed in the whorls.
161. *DRAPARNALDIA*. Filaments gelatinous, branched, jointed; branchlets jointed, in pencil-like tufts or scattered.
162. *LYNGBYA*. Filaments simple, elongate, not gelatinous, marked with close transverse septa.

***** *Olive-green or purplish, capillary, continuous, with internal granules arranged in lines.*

163. *BANGIA*. Filaments capillary, mostly simple, flexile; fructification—granules disposed in regular transverse series.

164. **SCHIZONEMA.** Filaments free, continuous, composed of other smaller filaments longitudinally united, and containing elliptical granules.

***** *Green, rarely coloured, gelatinous, subglobular, internally filled with filaments simple or branched, jointed or continuous.*

165. **CHÆTOPHORA.** Fronds gelatinous, globose or branched; the filaments jointed, branched, terminated with pellucid ciliæ.

166. **LINCKIA.** Frond gelatinous, subglobose, blackish-green; the filaments slender, continuous, radiating from a base.

167. **NOSTOC.** Frond gelatinous, subglobose, plicate; the filaments moniliform, simple.

168. **COCCOCHLORIS.** Frond gelatinous, globose or undefined, filled with round or elliptical granules.

***** *Anomalous.*

169. **OSCILLATORIA.** Filaments simple, very slender and hyaline, marked with transverse septæ, and immersed in a gelatinous fluid.

170. **GOMPHONEMA.** Hyaline geminate cuneiform corpuscula produced at the extremity of flexible branched filaments.

171. **ECHINELLA.** Hyaline rigid, sublinear corpuscula, often united in a wedge-like form, free.

123. LICHINA.

1. *L. pygmæa*, frond compressed, somewhat palmate above; capsules globose; about half an inch high.—Hook. *Scot.* ii. 96. GREV. *Crypt. Fl.* t. 219. *Alg. Brit.* 22. *Fucus pygmæus*, LIGHTF. *Scot.* 964. t. 32. WITH. iv. 109.

Hab. On rocks near high-water mark, in wide irregular black patches. Very plentiful about the Needle-eye.
Aut. 7/

2. *L. confinis*, frond cylindrical, irregularly branched, 2 or 3 lines in height; capsules oval, terminal.—GREV. *Crypt. Fl.* t. 221.
Alg. Brit. 23. *Lichen confinis*, *Eng. Bot.* t. 2575.

Hab. On the black rocks at Bamborough, abundantly, Dr Greville. On the sandstone rocks of Hudshead, where it can be moistened by the surf only at full tide.
Aut. 7/

124. FUCUS.

• *Frond with a midrib.*

1. *F. vesiculosus*, frond plane, dichotomous, generally with vesicles placed in pairs; margin entire; receptacles mostly elliptical, yellowish, terminating the segments.—LIGHTF. *Scot.* 904. WITH. iv. 91. HOOK. *Scot.* ii. 94. GREV. *Fl. Edin.* 283; *Crypt. Fl.* t. 319; *Alg. Brit.* 12. NEILL in *Edin. Encycl.* x. 18.

Hab. Coasts of Berwickshire and N. Durham, very common. Spring. 7/

This species covers the rocks of our shores, and it also grows plentifully at the margins of the river for the space of a mile and a half from the mouth. The river plants, however, are thinner, darker coloured, and less loaded with vesicles than the marine, and the ends of the branches, in the spring season, are much enlarged and swollen with air. In this state they are identical with the *F. inflatus* of some botanists. LIGHT. *Scot.* 910. When the frond, as often happens, is altogether destitute of bladders, and has become twisted by the action of the waves, it is sometimes called *F. spiralis*, WITH. iv. 100.

It is the sea-ware most highly prized for the manufacture of kelp, a valuable source of revenue to the proprietors of the rocky shores of Europe, particularly of Britain, and more especially of the northern and western islands of Scotland. Formerly a small quantity of kelp was made near Berwick and other villages on this coast, but the practice has been discontinued for some years. In the Scottish islands this fucus forms a considerable part of the winter food of horses, cattle and sheep, which seem in-

stinctively to migrate from the hills to the shore at the ebbing of the tide to feed upon it. LIGHTFOOT mentions that during severe snow storms, stags have been known to descend from the mountains for the same purpose. He also says that in some of the islands, the inhabitants cover their cheeses with the ashes of *F. vesiculosus*, and thus supply the place of salt. In Jersey it is collected and dried in July, and housed for winter fuel; being likewise used in smoke-drying pork, beef, and fish.

Dr RUSSELL found the mucus of the receptacles to be a very efficacious resolvent when applied externally to scrofulous swellings. He recommends the patient to rub the tumour with these receptacles bruised in his hand, until the mucus has thoroughly penetrated the part, and afterwards to wash it with sea-water. The late discovery of the existence of iodine in marine algæ affords a good argument in favour of this practice. "The charcoal obtained by burning it in close vessels has in some places got the name of *Æthiops vegetabilis*. It used to be considered merely as a compound of charcoal and carbonate of soda, and as such was neglected; but it contains also iodine, and since Dr COINDET's discovery of iodine as a specific in bronchocele and strumous affections, its effects are deserving of being again studied."—Dr DUNCAN.

2. *F. serratus*, frond plane, dichotomous, dotted, the margin serrated; ends of the segments when in fruit thickened, tubercular, orange-coloured.—LIGHTF. *Scot.* 902. WITH. iv. 99. NEILL in *Edin. Encycl.* x. 19. HOOK. *Scot.* ii. 95. GREV. *Alg. Brit.* 15.

Hab. On rocks, common. Spring. ¼

This scarcely enters the river, though it may be found just at its mouth. The Dutch cover their crabs and lobsters with it to keep them alive, preferring it to any other sort on account of the smaller quantity of mucus which it contains. Our fishermen use it indiscriminately with the preceding.

* * *Frond without a midrib.*

3. *F. nodosus*, frond compressed, dichotomous, swollen at intervals into large vesicles, the sides beset at intervals with club-shaped processes, single or clustered, turgid and yellow when in fruit.—LIGHTF. *Scot.* 919. WITH. iv. 90. NEILL *loc. cit.* x. 18. HOOK. *Scot.* ii. 94. GREV. *Alg. Brit.* 16.

Hab. On rocks near high-water mark, common. Spring. 7/

The air-bladders, when dried, become as black as ebony, and are sometimes polished and strung into necklaces. "Boys amuse themselves with the air-bladders, by cutting the larger ones transversely, near the ends, and making whistles of them." The air in the bladders is common atmospheric air. *F. nodosus* just enters the river, where, however, it grows luxuriantly.

4. *F. canaliculatus*, frond narrow, dichotomous, channelled, entire, without vesicles; receptacles terminal, oblong, simple or bifid.—LIGHTF. *Scot.* 917. WITH. iv. 108. HOOK. *Scot.* ii. 96. GREV. *Alg. Brit.* 18.

Hab. On rocks near high-water, plentiful, in tufts 3 or 4 inches high. Summer 7/

5. *F. siliquosus*, frond narrow, compressed; branches distichous, alternate, the branchlets plane, linear, entire; vesicles stalked, oblong, nodose; receptacles stalked, podlike, lanceolate, terminal. 1 to 2 feet long, olive, spreading.—LIGHTF. *Scot.* 921. WITH. iv. 95. HOOK. *Scot.* ii. 94. *Cystoseira siliquosa*, GREV. *Fl. Edin.* 285. *Halidrys siliquosa*, GREV. *Alg. Brit.* 9.

Hab. In pools among the rocks between low and high water marks, common. 7/

125. DESMARESTIA.

1. *D. aculeata*, frond cartilaginous, compressed, very narrow and linear, much branched; branches scattered, alternate, elongate, acute, the extreme ones set with erect subulate spines. Olive green, 1 or 2 feet long.—GREV. *Alg. Brit.* 38. *Fucus aculeatus*, LIGHTF. *Scot.* 924. WITH. iv. 126. *Sporochnus aculeatus*, HOOK. *Scot.* 96. GREV. *Fl. Edin.* 287.

Hab. Frequent on the coast in deep water. 7/

126. FURCELLARIA.

1. *F. lumbricalis*, olive-brown or reddish, a span high; stalk as thick as a crow-quill, thickening upwards, and at the height of 3 or 4 inches dividing into a level-topped bundle of acutely-forked branches.—HOOK. *Scot.* 97. *F. fastigiata*, GREV. *Alg. Brit.* 67.

Fucus fastigiatus et *furcellatus*, LIGHTF. Scot. 930-2. *F. fastigiatus*, WITH. iv. 123. *F. lumbricalis*, Eng. Bot. t. 824.

Hab. Coasts of N. Durham and Berwickshire, very common. Winter. 7

127. HIMATHALIA.

1. *H. lorea*, compressed, dichotomous, elongate, springing from a stalked cup-like base. (*Sea thongs*).—GREV. *Alg. Brit.* 20. *Fucus loreus*, LIGHTF. Scot. 920. WITH. iv. 104. NEILL in *Edin. Encycl.* x. 19. HOOK. Scot. ii. 96. WAHL. *Fl. Lapp.* 499.

Hab. On rocks at low-water mark, common on the coast of Berwickshire. Spring. ☉

“The first rudiment of this fucus exactly resembles a *Pezi-za*, or a smooth, circular concave disc like a saucer, an inch or more in diameter, of a livid colour, and tough coriaceous substance, supported by a cylindrical footstalk, about half an inch long.” From the centre of this leather-like cup, which WAHLENBERG and GREVILLE consider the true frond, the receptacles shoot, reaching often a length of 6 feet, and divided in a regular dichotomous manner into long linear segments tapered at the ends. The whole has been aptly compared to a leather-thong. “In the north of Scotland, a kind of sauce for fish or fowl, somewhat resembling ketchup, is made from sea-weeds, frequently from the cup-like frond or base of *F. loreus*.”—NEILL.

128. LAMINARIA.

▪ *Frond ribbed throughout.*

1. *L. esculenta*, stalk short, percurrent, winged near the base with several plane, nerveless, linear-oblong leaflets; frond ensiform, thin, pellucid, greenish-olive, entire.—HOOK. Scot. ii. 98. *Fucus esculentus*, LIGHTF. Scot. 938. t. 28. WITH. iv. 102. NEILL *lib. cit.* x. 21. *Alaria esculenta*, GREV. *Alg. Brit.* 25.

Hab. Coast of Berwickshire, not uncommon. ☉

“The frond varies from 6 to 20 feet in length, with a mid-rib extending the whole way. The mid-rib, stripped of its membrane, is the part chiefly eaten; but in some places, particularly in Orkney, the pinnæ are also eaten, under

the name of mirkles.”—NEILL. This is the *Fucus foliolosus* of Dr WALKER, *Essays*, p. 290, which the editor of his work has erroneously referred to the *F. saccharinus* of LINNÆUS.

* * *Fronde ribless, cleft into unequal segments.*

2. *L. digitata*, stalk round, tapered; frond olive-brown, smooth, broad, palmate, torn into many mostly simple segments. (*Tangle*.) —HOOK. *Scot.* ii. 99. GREV. *Alg. Brit.* 27. *Fucus digitatus*, LIGHTF. *Scot.* 935. WITH. iv. 107. NEILL in *Edin. Encycl.* x. 20.

Hab. Coast of Berwickshire and N. Durham within low-water mark, and in pools amongst the rocks, common. 2/

During storms great numbers of this large species are torn from the rocks and cast on shore, bearing with them a rich harvest to the naturalist. In the crevices of the matted roots, shells and worms of various kinds and singular structure find shelter, or a secure place for constructing their furrows; and many elegant corallines spring up between them, to appearance trees in miniature, but in reality cities full of living inhabitants. The more delicate and richly coloured sea-weeds are parasitical on the stem; while the broad frond affords an ample field for many pretty shell-fish to feed and course upon.

Sea-tangle, in common with the other refuse of the sea, is extensively collected for manure. In some places of the Western Islands of Scotland, it forms even a sort of soil on the pebbles of the beach, in which the poor natives sow barley; and as the sea-weed rots, the grain drops with it into the interstices, so that when the harvest is ready, it is seen growing on a surface of naked and polished pebbles. In the same islands the long stalks are dried for fuel; and from select pieces of them knife-handles have been made, which are hardly to be distinguished from hartshorn. The plant may be burned also for kelp, as the fronds yield more alkali than any other species commonly used.

3. *L. bulbosa*, “stem plane, with a waved foliaceous margin, once twisted at the base, arising from a large rough roundish hollow bulb; frond roundish, oblong or reniform, cleft deeply into numerous segments.”—HOOK. *Scot.* ii. 99. GREV. *Alg. Brit.* 29. *Fucus bulbosus*, Eng. Bot. t. 1760. *F. polyschides*, LIGHTF. *Scot.*

936. WITH. iv. 106. *Phasgenon Columbæ*, WALKER'S *Essays*, 186.

Hab. Shores of the Holy Island, in deep water. 2/

*** *Fronde ribless, undivided.*

4. *L. saccharina*, stalk cylindrical, short, expanding into a cartilaginous olive-brown linear or linear-oblong frond, smooth or puckered, with waved margins. (*Sea Belts*).—HOOK. *Scot.* ii. 98. GREV. *Alg. Brit.* 32. *Fucus saccharinus*, LIGHTF. *Scot.* 940. WITH. iv. 105. NEILL in *Edin. Encycl.* x. 20.

Hab. Coast of Berwickshire near low-water mark, common. 2/

“This common species, which grows to the length of 6 or 7 feet, derives its specific name from its being, after it is steeped in fresh water and exposed to the sun, covered with a white efflorescence resembling sugar, but nauseous to the taste. It is not the ‘saccharine fucus’ of the Icelanders, as has been generally supposed.”—HOOKER. “When dry, and suspended in an airy place, it forms an admirable hygrometer, and preserves its qualities for years.”—STACKHOUSE.

L. saccharina and *digitata* have been observed to renew their fronds in a very curious manner. A new frond proceeds from the top of the stalk, and gradually pushes before it the old one after this has discharged its office, a deep contraction marking the place of separation between the two. The phenomenon is not of unfrequent occurrence.

5. *L. phyllitis*, stalk cylindrical, compressed upwards, passing into a thin, membranaceous linear-lanceolate frond, tapered towards each end, pale yellowish-brown, smooth, the margins wavy. GREV. *Alg. Brit.* 34. *Fucus phyllitis*, WITH. iv. 109.

Hab. Coast of Berwickshire, rare.

Some excellent observers suppose this to be the young of the preceding, or a variety produced by local causes, and they are probably right; yet when recent specimens of equal size are compared, the difference in firmness, thickness, and colour, is obvious enough.

129. HALYMENIA.

1. *H. Brodiaei*, “stem cylindrical, filiform, somewhat dichoto-

mous, the branches expanding into oblong mostly forked frondlets, proliferous from their marginal extremity; capsules spherical, sessile at the apices of the frondlets.”—*Bot. Gall.* ii. 942. *Fucus Brodiaei*, *Eng. Bot.* t. 1966. *Sphærococcus Brodiaei*, *HOOK. Scot.* ii. 103. *Chondrus Brodiaei*, *GREV. Alg. Brit.* 133.

Hab. Amongst sea refuse, rare. Winter. 7/

2. *H. membranifolia*, “stem cylindrical, filiform, branched, the branches expanding into many-cleft wedge-shaped frondlets; capsules ovate, shortly pedicellate and arising from the stem;” about 3 inches high, red, thin and semitransparent—*Bot. Gall.* ii. 943. *Fucus membranifolius*, *Eng. Bot.* t. 1965. *Sphærococcus membranifolius*, *HOOK. Scot.* ii. 102. *Chondrus membranifolius*, *GREV. Alg. Brit.* 131.

Hab. Amongst refuse of the sea. 7/

3. *H. rubens*, “stem very short, expanding into a linear wedge-shaped frond, obscurely ribbed, and repeatedly branched with proliferous shoots resembling the primary frond; fructification—hemispherical, sessile, very rugose capsules, on the disk of the frond.”—*Bot. Gall.* ii. 943. *Fucus prolifer*, *LIGHTF. Scot.* 949. t. 30. *Sphærococcus rubens*, *HOOK. Scot.* ii. 102. *Phyllophora rubens*, *GREV. Alg. Brit.* 135.

Hab. On the sides of pools in the rocks, rare. At the Coves.

About 5 inches long, and rather more than a quarter of an inch broad. The authors of the *Description of British Fuci*, in the 3d vol. of the *Linn. Trans.* p. 166., suggest that the remarkable proliferous tendency of this plant may be not its natural mode of growth, but the effect of some injury. The opinion is very improbable, seeing that the plant is invariably proliferous; and with us it grows in places much sheltered, and as far removed from violence as it well can be.

4. *H. edulis*, stalk very short, expanded into an obovate thickish frond, rounded at the summit, simple or cleft by the waves, purplish red.—*SPRENG. Syst. Veg.* iv. 333. *Bot. Gall.* ii. 944. *HOOK. Scot.* ii. 107. *Fucus edulis*, *WITH.* iv. 110. *NEILL* in *Edin. Encycl.* x. 22. *Ulva edulis*, *GREV. Fl. Edin.* 298. *Iridæa edulis*, *GREV. Alg. Brit.* 158.

Hab. On rocks near low-water mark, not uncommon. ♂

The frond is generally perforated with holes eaten through by marine insects, with which the *H. edulis* appears to be a favourite. It is eatable, but does not occur in sufficient quantities to be commonly used. "Mr STACKHOUSE observed the frond to give out a fine purple colour to the water in which it was macerating; and the Rev. W. GREGOR obtained a fine lake from an infusion with the assistance of alum."—GREVILLE.

5. *H. palmata*, stalk very short, expanded into a thin membranaceous purplish-red palmate frond, deeply cleft, the segments oblong, mostly simple, entire, frequently proliferous. (*Dulse.*)—HOOK. *Scot.* ii. 107. *Fucus palmatus*, LIGHTF. *Scot.* 933. t. 27. WITH. iv. 110. NEILL in *Edin. Encycl.* x. 21. *Ulva palmata*, GREV. *Fl. Edin.* 298. *Rhodomenia palmata*, GREV. *Alg. Brit.* 93.

Hab. On the stems of *Laminaria digitata*, and on rocks near low-water mark, abundant.

"Hunc Hiberni Scotique apud quos copiose invenitur, studio exsiccatum et convolutum assidue in ore habent et masticant."—RAY. The less agreeable tobacco has supplanted this use of dulse, which, however, in a raw state, is still occasionally eaten by the common people, from a belief of its being a sweetener of the blood, and a remedy for scorbutic complaints. "There is," says Mr NEILL, "a common saying in Stronsa, that he who eats of the dulse of Guiodin, and drinks of the wells of Kildingie, will escape all maladies except black death." To the Icelanders *H. palmata* is a plant of considerable importance. They prepare it by washing it well in fresh water, and exposing it to dry, when it gives out a white powdery substance, which is sweet and palatable, and covers the whole plant; they then pack it in casks to keep it from the air, and thus preserve it ready to be eaten either in this state, with fish and butter, or, according to the practice of wealthier tables, boiled in milk, and mixed with a little flour of rye. The cattle are also very fond of this sea-weed, and the sheep are said to seek it with such avidity as often to be lost by going too far from the land at low water.—*Quart. Rev.* vii. 63.

6. *H. lacerata*, frond scarcely stalked, rose-colour, thin, transparent, membranous, longitudinally veined at the base, torn into unequal ragged segments, crisped and undulate at the edges.—

Bot. Gall. ii. 944. *Fucus endiviæfolius*, LIGHTF. *Scot.* 948. t. 32. *F. laceratus*, *Eng. Bot.* t. 1067. *Delesseria lacerata*, HOOK. *Scot.* ii. 101. *Nitophyllum laceratum*, GREV. *Alg. Brit.* 83.

Hab. On the stems of *Laminaria digitata*, not common. ☉

7. *H. laciniata*, frond stemless, bright red, subopake, somewhat cartilaginous, expanded, deep and irregularly cut; segments dilated upwards, irregularly palmate, blunt, with even or fringed margins.—*Bot. Gall.* ii. 945. *Fucus laciniatus*, LIGHTF. *Scot.* 947. *Sphærococcus laciniatus*, HOOK. *Scot.* ii. 103. *Rhodomenia laciniata*, GREV. *Alg. Brit.* 86.

Hab. Coasts of Berwickshire and N. Durham, frequent.

I have a specimen of this species, in which there are scattered irregularly over the frond small circular clusters of papillary tubercles about a line in height. The papillæ contain minute oval granules, and each cluster or tuft is composed of about 20 papillæ. It is a sort of fructification unnoticed by Dr GREVILLE, and perhaps affords a proof that characters drawn from the parts of fructification in the classification of the *Algæ*, are only of subsidiary value.

8. *H. cristata*, "frond semicircular, membranaceous, subdichotomous, the segments somewhat dilated upwards, repeatedly subdivided, the divisions alternate decurrent lacinate at the ends; capsules spherical, imbedded in the margin of the frond."—*Sphærococcus cristatus*, GREV. *Crypt. Fl.* t. 85. *Rhodomenia cristata*, *Alg. Brit.* 89.

Hab. On the roots of *Laminaria digitata*, very rare. ☉

My specimen, though small, answers in other respects very well to the figure and description of Dr GREVILLE.

130. DELESSERIA.

1. *D. sanguinea*, stalk cylindrical, branched; leaves stalked, large, oblong-ovate, entire, undulate, transversely veined; fructification stalked, attached to the midrib.—HOOK. *Scot.* ii. 100. GREV. *Alg. Brit.* 72. *Fucus sanguineus*, LIGHTF. *Scot.* 942. WITH. iv. 102.

Hab. Coasts of Berwick and N. Durham, frequent. ♂

2. *D. sinuosa*, stalk cylindrical, branched; leaves oblong, sinuate or pinnatifid, transversely veined, the margins spinous; seed-leaflets linear.—HOOK. *Scot.* ii. 100. GREV. *Alg. Brit.* 73. *Fucus sinuosus*, WITH. iv. 103. *F. rubens*, LIGHTF. *Scot.* 943.

Hab. Rather rare on the immediate coast, and only amongst sea refuse, but more common to the north of Berwickshire, growing on the stems of *Laminaria digitata*.

3. *D. alata*, stalk linear, flattened, dichotomously branched, much divided towards the extremities, winged throughout with a narrow veinless membrane; seed-leaflets lanceolate, mostly at the apex of the segments.—HOOK. *Scot.* ii. 100. GREV. *Alg. Brit.* 74. *Fucus alatus*, LIGHT. *Scot.* 951. WITH. iv. 104.

Hab. On the stalks of *Laminaria digitata*, common.

Of a dark red-rose colour, 3 or 4 inches high. The lateral membrane is often worn away by the action of the waves.

131. ODONTHALIA.

1. *O. dentata*, "frond branched, spreading, the branches distichous, alternately pinnatifid, pinnulæ toothed at their apex; capsules ovate, pedunculate, paniced, in axillary clusters."—GREV. *Alg. Brit.* 101. *Fucus dentatus*, LIGHTF. *Scot.* 952. WITH. iv. 112. *Sphærococcus dentatus*, HOOK. *Scot.* ii. 102.

Hab. Coast of Berwickshire, not uncommon. 7

132. CHONDRUS.

1. *C. mammillosus*, frond dichotomous, channelled on one side; segments elongate, wedge-shaped, entire, covered on both surfaces with numerous small wart-like tubercles.—GREV. *Alg. Brit.* 127. *Fucus mammillosus*, WITH. iv. 107. *F. ceranoides* ε, LIGHTF. *Scot.* 916. *Sphærococcus mammillosus*, HOOK. *Scot.* ii. 102.

Hab. On rocks, in tufts about 3 or 4 inches high. 7

2. *C. crispus*, frond dichotomous, plane, the margin entire; segments spreading, linear, with bifid apices; capsules subhemispherical, imbedded in the disk of the frond.—GREV. *Alg. Brit.* 129.

Fucus crispus, Eng. Bot. t. 2285. *F. ceranoides*, LIGHTF. Scot. 913. *Sphærococcus crispus*, HOOK. Scot. ii. 102.

Hab. On rocks very common, in tufts from 2 to 4 inches high. ʒ

Very variable in form and colour. It is very plentiful in the pools left by the recess of the tide, but our finest specimens were taken from the stems of *Laminaria digitata*. The frond is often partially iridescent. In Ireland, as I am informed by my friend W. C. TREVELYAN, Esq. a sort of isinglass is prepared in considerable quantities from this sea-weed. On boiling with water, it forms a strong transparent jelly, which, with the admixture of lemon and sugar, makes an agreeable medicine in ordinary coughs, and probably more efficacious than the usual demulcents, from the small portion of iodine which the mixture may contain. It is sometimes sold in the apothecaries' shops as a substitute for Iceland moss (*Cetraria islandica*).—NEILL.

133. GELIDIUM.

1. *G. corneum*, frond between cartilaginous and corneus, compressed, repeatedly pinnated, pinnæ and pinnulæ spreading, long, very thin, acute and irregularly divided; capsules spherical, immersed in the extremities of the ramuli.—GREV. *Alg. Brit.* 143. *Fucus nereideus*, LIGHTF. Scot. 956. *Sphærococcus corneus*, HOOK. Scot. ii. 104.

Hab. Black rocks near Bamburgh, Dr Greville. ʒ

134. LAWRENCIA.

1. *L. pinnatifida*, frond cartilaginous, compressed, branched; branches pinnatifid, obtuse and bluntly toothed.—GREV. *Alg. Brit.* 108. *Fucus pinnatifidus*, LIGHTF. Scot. 953. WITH. iv. 119. NEILL in *Edin. Encycl.* x. 22. *Chondria pinnatifida*, HOOK. Scot. ii. 105.

Hab. On rocks, very common. Summer. ☉

From 1 to 3 inches high, purplish-brown, frequently growing on the sides of rocks in a somewhat imbricate manner. A variety of a yellowish colour, with a cylindrical frond, the branches simple, short and crowded towards the summit, is likewise abundant on our coast. This grows in dense erect tufts in shallow pools much exposed to the sun, while the

plant, in its more characteristic form, prefers a shaded situation, and one nearer the ebb tide. "This fucus has a hot taste in the mouth, and is therefore called pepper dulse by the people in Scotland, who frequently eat it as a sallad."—LIGHTFOOT. This custom has become obsolete, nor is it likely to be revived, for both the taste and odour of the plant are disagreeable.

135. PLOCAMIUM.

1. *P. coccineum*, frond narrow, compressed, much branched; branches spreading, irregularly dichotomous, the secondary and ultimate ones alternately pectinated, subulate.—GREV. *Alg. Brit.* 98. *Fucus coccineus*, WITH. iv. 134. NEILL in *Edin. Encycl.* x. 23. *F. Plocamium*, LIGHTF. *Scot.* 957. *Delesseria coccinea*, HOOK. *Scot.* ii. 101.

Hab. On the shore near Berwick plentifully, Ray. Often parasitical on *Laminaria digitata*. ʒ

A remarkably elegant sea-weed, from 3 to 6 inches in height, and of a very beautiful red colour, hence "most admired by the ladies who are fond of pictures and mimic landscapes, composed of marine vegetables,"—a sort of fancy work out of date, though once the favourite amusement of our princesses.

2. *P. plumosum*, frond narrow, compressed, much branched; branches spreading, irregular, the branchlets opposite, patent, close set, and beautifully pectinated with subulate processes.—*Bot. Gall.* ii. 949. *Fucus plumosus*, LIGHTF. *Scot.* 955. WITH. iv. 135. NEILL *lib. cit.* x. 23. *Ptilota plumosa*, HOOK. *Scot.* ii. 106. GREV. *Alg. Brit.* 155.

Hab. On the stems of *Laminaria digitata*, very common. ʒ

A variety of this elegant fucus, with a narrow flaccid frond and jointed ramuli, grows abundantly on the sides of rocks in pools of sea-water; and it is remarkable that this is never infested and disfigured with *Austræ*, as the parasitical plants very commonly are.

WAHLENBERG says that the native rose-purple colour of this species becomes violet in fresh water, then brick-red, and lastly green if well washed. To preserve the original colour the acid of the sea water seems necessary, but this being removed, the plant changes to green as if an alkali

had been poured over it.—*Fl. Lap.* 501. That some of the red *Ceramia* undergo these changes with considerable rapidity is true, but I have not observed this *Plocamium* to do so. Immersed in fresh water the native dark red becomes perhaps brighter, but not the slightest taint is communicated to the water, and the plant suffers no further change when it has been kept for several days constantly steeped. When, however, it is left to bleach on the shore, it suffers the changes mentioned by WAHLENBERG.

136. LOMENTARIA.

1. *L. clavellosa*, frond gelatinous, pink, much and irregularly branched; branches distichous, repeatedly pinnate, the ultimate ramuli more or less lanceolate, attenuated at their base; capsules conical.—*Bot. Gall.* ii. 950. *Fucus clavellosus*, *Eng. Bot.* t. 1203. *Chondria clavellosa*, *HOOK. Scot.* ii. 105. *Gastridium clavellosum*, *GREV. Alg. Brit.* 115.

Hab. Berwick Bay, amongst sea refuse, rare. ☉

2. *L. articulata*, frond reddish-pink, tubular, contracted and chain-like; branches fastigate, dichotomous, and whorled; capsules obtusely conical.—*Bot. Gall.* ii. 950. *Fucus articulatus*, *LIGHTF. Scot.* 959. *Chondria articulata*, *HOOK. Scot.* ii. 106. *Gastridium articulatum*, *GREV. Alg. Brit.* 120.

Hab. On rocks near low-water mark, abundant, but concealed in general by the larger kinds. ☉

137. POLYIDES.

1. *P. rotundus*, frond 3 to 6 inches high, dark purplish-brown, dichotomous; branches fastigate.—*GREV. Alg. Brit.* 70. *Fucus rotundus*, *WITH.* iv. 123. *Chordaria rotunda*, *HOOK. Scot.* ii. 97. *Spongiocarpus rotundus*, *GREV. Fl. Edin.* 286.

Hab. Coast of Berwickshire, rare. 2/

When not in fruit this Alga is with difficulty to be distinguished from *Furcellaria fastigiata*, but the root of the former is a small solid disk, while that of the latter is fibrous.

138. GIGARTINA.

1. *G. flagelliformis*, frond cylindrical, filiform, nearly equal throughout, more or less branched; branches long, straight, nearly simple, and somewhat distichous, those at the base horizontal; 6 to 24 inches in length, dark olive-green.—*Bot. Gall.* ii. 952. *Fucus flagelliformis*, LIGHTF. *Scot.* 928. *Chordaria flagelliformis*, HOOK. *Scot.* ii. 98. GREV. *Alg. Brit.* 44.

Hab. Coast of Berwickshire in pools, not uncommon. ☉

2. *G. purpurascens*, frond cylindrical, filiform, much branched; branches very bushy, erect; branchlets irregular, very numerous, attenuated at each extremity; capsules spherical, immersed in the branchlets.—*Bot. Gall.* ii. 952. *Fucus tuberculatus*, LIGHTF. *Scot.* 926. *F. purpurascens*, WITH. iv. 127. *Sphaerococcus purpurascens*, HOOK. *Scot.* ii. 104. *Gracillaria purpurascens*, GREV. *Alg. Brit.* 122.

Hab. In deep pools on the rocky coast of Berwickshire, not uncommon. ☉

From 9 to 12 inches long, purplish. Root fibrous. Stalk as thick as a crow quill, unbranched for an inch or two at the base, continued throughout, and very bushy. Tubercles in the smallest branches very distinct.

3. *G. plicata*, fronds horny, rigid, cylindrical, filiform, equal throughout and entangled; branches scattered, very patent, almost simple, mostly from one side; warts oblong, embracing the stem.—GREV. *Alg. Brit.* 150. *Fucus plicatus*, LIGHTF. *Scot.* 929. WITH. iv. 127. *Sphaerococcus plicatus*, HOOK. *Scot.* ii. 104.

On rocks in entangled blackish tufts, 3 or 4 inches long. ♀

139. RHODOMELA.

1. *R. lycopodioides*, frond cylindrical, elongated, mostly simple, densely clothed with finely divided bushy ramuli, intermixed with the setaceous remains of a former series at their base.—GREV. *Alg. Brit.* 102. *Fucus lycopodioides*, WITH. iv. 119. *Furcellaria lycopodioides*, HOOK. *Scot.* ii. 97. *Gigartina lycopodioides*, GREV. *Fl. Edin.* 289.

Hab. On the stems of *Laminaria digitata*, not uncommon.

¼ A span high, purplish-brown, black when dried.

2. *R. subfusca*, frond cylindrical, very much branched, the branches alternate, erecto-patent, subulate at the points; branchlets setaceous, subulate, clustered.—GREV. *Alg. Brit.* 103. *Fucus subfuscus*, Eng. Bot. t. 1164. *Sphærococcus subfuscus*, Hook. Scot. ii. 104. *Gigartina subfusca*, GREV. *Fl. Edin.* 289.

Hab. On rocks, not uncommon. A span or more in length, brownish-red.

140. ASPEROCAULON.

1. *A. Arbuscula*, frond deep red, bushy, the stem naked at the base, percurrent, not jointed; branches compound, tufted, somewhat whorled, the ultimate branchlets alternate; articulations about as long as broad.—GREV. *Fl. Edin.* 307. *Hutchinsia arbuscula*, Hook. Scot. ii. 89. *Conferva arbuscula*, DILLW. *Conf.* p. 80. t. 85. and c. Eng. Bot. t. 1916. opt.

Hab. On rocks, in tufts somewhat more than an inch high, rare.

141. POLYSIPHONIA.

1. *P. fastigiata*, tufted, very much branched; branches dichotomous, fastigiate, the ultimate ones very short; articulations shorter than their diameter, with a dark spot in the centre; capsules subterminal, ovate, sessile.—GREV. *Fl. Edin.* 303. *Conferva polymorpha*, LIGHTF. Scot. 989. WITH. iv. 164. DILLW. *Conf.* p. 81. t. 44. *Hutchinsia fastigiata*, Hook. Scot. ii. 87.

Hab. On *Fuci*, particularly on *F. nodosus*, very common.

Grows in dense dark reddish-brown bushy tufts from 1 to 2 inches high, with a rounded top, rigid, so that when removed from the water it does not collapse. The ultimate branches are short, alternate, and very patent. The dark spot in the centre of the articulations is rarely to be distinguished except in the extreme branches, where in general it is very obvious, although I have examined specimens where there was no trace of it. Scarcely adheres to paper.

2. *P. fucoides*, blackish-brown; stalk rigid below and bare, much branched; branches irregularly alternate, the ultimate ones patent, crowded and dichotomous at the top; articulations longer than broad or equal; tubercles ovate, subsessile.—GREV. *Fl. Edin.* 398. *Conferva fucoides*, DILLW. *Conf.* p. 81. t. 75. fig. 1. and 3. *Hutchinsia fucoides*, HOOK. *Scot.* ii. 87. *Hut. nigrescens*, L'YNG. *Hydroph. Dan.* 109. t. 33.

Hab. On rocks and other Algæ, very common.

From 4 to 6 inches long. The stalk is as thick as stout thread, rigid, black, rough below with the remains of former branches, soon giving off several long compound branches, and becoming very bushy upwards. The superior branches are dull reddish-brown, and rather flaccid, fasciculate, dichotomous, tapered, generally marked with imbedded tubercles, and terminated with many pellucid fibres. The articulations of the stem are shorter than their diameter; in the branches they are equal or about one-half longer; all are distinctly polystriate. Adheres imperfectly to paper. Subject to some variety, and yet the practical botanist recognises it without difficulty by its dark dull colour, its rigid stalk, elongate flattened form, and the bushiness of the superior branches. The description which L'YNGBYE has given of *Hutchinsia violacea* is by no means applicable to our plant, which appears to be his *H. nigrescens*.

3. *P. nigrescens*, reddish-brown; stalk filiform, continued throughout, very much branched; branches irregular, compound, spreading, fibrillose; articulations about one-half longer than their breadth.—GREV. in *litt. Hutchinsia nigrescens*, AGARDH. *Conferva nigrescens*, DILLW. *Syn.* p. 81.

Hab. Coast near Berwick, rare.

Our specimen of this species has been compared by Dr GREVILLE with a specimen of *H. nigrescens* from AGARDH, with which it agrees, so that no doubt can be entertained of the synonym. It is nearly allied to the preceding, and has often perhaps been confounded with it, for I think it probable that the middle figure (2.) of DILLWYN's, tab. 75., represents this plant rather than any variety of *P. fucoides*. Several stems arise from the same base, the whole forming a tuft 3 or 4 inches in height. Each stem is continued throughout of the thickness of sewing thread, branched on

all sides irregularly and closely, the branches being themselves branched and very slender, but nowhere fasciculate. The articulations of the stem are equal in length to their breadth; those of the branches somewhat longer. The only fruit I have seen are tubercles imbedded in the extreme branches. Adheres slightly to paper.

4. *P. Brodiaei*, purplish-brown, soft, very bushy; main stalk not jointed, irregularly branched, ultimate branches fasciculate, dichotomous, tapered, with articulations longer than broad.—SPRENG. *Syst. Veg.* iv. 349. *Hutchinsia Brodiaei*, HOOK. *Scot.* ii. 88. *Hut. atro-rubescens*, LYNGB. *Hydroph. Dan.* 110. *Conferva Brodiaei*, DILLW. *Conf.* p. 81. t. 107.

Hab. On rocks and other Algæ, not common.

On this coast *P. Brodiaei* does not exceed 4 inches in height, and is often much less. It is soft, dark brown, very bushy, and on drying adheres closely to paper. The stem is olivaceous, without any appearance of joints, but the branches exhibit plainly enough the character of the genus. The ultimate ones often contain tubercles, and are terminated with pellucid fibres. The description which LYNGBYE gives of his *Hutchinsia atro-rubescens* agrees very well with our plant, but the figure of that species in DILLWYN, to which he refers, corresponds neither with his own description nor with our specimens.

5. *P. badia*, reddish-brown, branched; branches erect, straight, elongate; secondary branches alternate, straight, tapered, nearly simple; articulations longer than their diameter, polystriate.—SPRENG. *lib. cit.* 350. *Conferva badia*, DILLW. *Conf.* p. 85. t. 6. *Hutchinsia badia*, HOOK. *Scot.* ii. 88.

Hab. Near low-water mark growing in sand.

About three inches high. The lower articulations are shorter than their breadth, the others about twice as long, except those of the ultimate branches which are again shorter, and have pellucid joints. Adheres imperfectly to paper. The figure of DILLWYN has been copied from bad specimens.

6. *P. stricta*, tufted, red, branched, straight; branches alternate, erect, rather close, dichotomous at the top; articulations of the main filaments 5 times as long as their diameter, those of the branchlets shorter, 2 or 3 striate.—GREV. *Fl. Edin.* 309. *Hut.*

chinsia stricta, LYNGB. *Hydroph. Dan.* 115. t. 36. *Conferva stricta*, DILLW. *Conf.* p. 83. t. 40.

Hab. On rocks in coves near high-water mark, abundant.

Grows in dense tufts 2 or 3 inches in height, and the component filaments rise nearly to a level. The colour of the whole is a dark red, but individual filaments are a fine pellucid rose-red, very distinctly articulated, with 2 or 3 longitudinal tubes. These sometimes cross each other, and are apparently interrupted in their continuity at each joint, which is pellucid. The branches come off at an acute angle, and are never collected into pencil-like tufts, or even much crowded; the ultimate ones, as LYNGBYE correctly remarks, are very seldom fibrilose. Adheres to paper, but not very closely. The specific character given by LYNGBYE is inapplicable, but his extended description, as well as his figure, surely belong to this species.

7. *P. urceolata*, "deep red; filaments capillary, very much branched, bushy; branchlets short, spreading; joints of the main branches long, those of the ramuli short; tubercles subpedunculate, urceolate."—GREV. *Fl. Edin.* 309. *Conferva urceolata*, DILLW. *Conf.* p. 82. t. G. *Hutchinsia urceolata*, Hook. *Scot.* ii. 88.

Hab. On the stems of *Laminaria digitata*, rare.

8. *P. allochroa*, red, cæspitose, much branched, strongly marked with the longitudinal tubes; branches dichotomous; branchlets subfasciculate, fibrilose; articulations of the main filaments long, those of the branchlets equal to their diameter.—LOUD. *Encycl.*, No. 15237. *Conferva fibrata*, DILLW. *Conf.* p. 84. t. G.

Hab. On the sides of the coves along the coast.

The name to our specimens of this and the preceding was attached by Mr ARNOTT, otherwise I would not have ventured in giving them insertion in this place, for I have not of late had an opportunity of examining recent specimens, and when dried it is a very difficult matter to determine the species of so intricate and yet so beautiful a genus.

142. CERAMIUM.

1. *C. elongatum*, dull red, somewhat opaque, dichotomously and rather diffusely branched; branches spreading, the ultimate ones

often tufted; articulations shorter than their diameter, even, areolar; joints opaque.—GREV. *Fl. Edin.* 310. *Conserva elongata*, DILLW. *Conf.* p. 80. t. 33. *Hutchinsia elongata*, HOOK. *Scot.* ii. 87.

Hab. On rocks in pools left by the tide, not common.

This is a large species, generally about 8 inches high, diffused; the main stalk and principal branches as thick as fine whip-cord, or rather they resemble the antennæ or horns of the lobster, to which they have frequently been compared. The extreme branches are in general terminated with a tuft of short and lighter coloured ones, the articulations of which are not areolar, but longitudinally striate, and separated by pellucid joints, exhibiting in fact the structure of a *Polysiphonia*; and, like the species of that genus, I have seen these extreme branchlets terminated with pellucid fibres.

2. *C. rubrum*, red, bushy, much branched in a dichotomous manner; extreme branches short and forcipate; articulations as long or longer than broad, areolar, contracted and diaphanous in the middle.—HOOK. *Scot.* ii. 84. GREV. *Fl. Edin.* 310. *Conser-va rubra*, DILLW. *Conf.* p. 78, t. 34. *C. nodulosa*, LIGHTF. *Scot.* 994.

Hab. On rocks and other algæ, very common.

Smaller than the preceding, more delicate and more highly coloured.

3. *C. diaphanum*, fine red, soft, much branched, diffuse; branches dichotomous, the ultimate ones rather tufted, forcipate; articulations subpellucid and contracted at the centre with red swollen joints.—HOOK. *Scot.* ii. 85. GREV. *Fl. Edin.* 310. *Conser-va diaphana*, LIGHTF. *Scot.* 996. DILLW. *Conf.* p. 78, t. 38. *Eng. Bot.* t. 1742.

Hab. Parasitical on various algæ, common.

This frequently equals *C. rubrum* in size, from which it is readily distinguished by its lighter colour, greater flaccidity, and more particularly, as Dr GREVILLE remarks, by its diffuse mode of growth. Young plants are of a uniform reddish-pink colour; they assume in their progress a duller red, and ultimately become spotted and yellowish, presenting to the naked eye the appearance of a

series of small beads alternately coloured and pellucid. The articulations of the main filaments are twice as long as broad; but in the smaller branches the length and breadth is about equal. The fruit, as I have observed it, consists of imbedded tubercles, arranged in irregular circles round the joints of the extreme branchlets.

4. *C. ciliatum*, tufted, much branched, fine red, pellucid; branches dichotomous, the ultimate ones remarkably forcipate; articulations longer than their diameter, areolar, the joints whorled with minute prickles.—HOOK. *Scot.* ii. 85. GREV. *Fl. Edin.* 311. *Conferva ciliata*, LIGHTF. *Scot.* 998. DILLW. *Conf.* p. 77, t. 53. *Eng. Bot.* t. 2428.

Hab. On rocks and algæ, not common.

Grows in small bushy masses, 1 or 2 inches in height. The spinous whorls of the joints are only to be discovered with the microscope, and their presence affords, perhaps, the principal distinction between *C. ciliatum* and *diaphanum*. I have, however, examined some specimens of the latter, in which the joints, of the extreme branches in particular, were armed on the external side with similar prickles, one to each articulation; and had they not been larger and more robust than is usual with *C. ciliatum*, I know not to which species these specimens could have been referred.

143. CALLITHAMNION.

1. *C. purpurascens*, purplish-red, tufted, excessively branched, slender; branches alternate, pinnate, the branchlets patent, alternate, tapered; articulations of the branches three times their diameter, of the branchlets scarcely twice, almost moniliform; fruit in lateral round sessile capsules on the branchlets.—*Conferva purpurascens*, *Eng. Bot.* t. 2465. *Ceramium thuyoides*, AGARDH. *Callithamnion roseum*, GREV. *Fl. Edin.* 511.

Hab. On rocks and other algæ, frequent.

For the name and synonyms attached to this beautiful species, I am indebted to Mr ARNOTT. It grows in small remarkably dense tufts of a dull reddish colour, and about an inch in height. Each plant may be compared to a delicate bushy shrub in miniature. The main branches are somewhat flexuose and irregular, but the branchlets are regularly alternate and patent. They agree almost exact-

ly with the magnified figure of *Conferva thuioides* in *Eng. Botany*, but the articulation of the stem in the latter is longer, and the habit of the plants is different. When parasitical on *Polysiphonia fucoides*, as it often is, *C. purpurascens* is less bushy, and of a fine pink colour, with pellucid joints. In general, at least, it does not colour fresh water on a short immersion, but often slightly stains the paper on which it is dried. After having been dried and again moistened, it exhales the odour of sweet violets.

2. *C. Turneri*, rose-coloured, crowded; filaments erect; pinnate or somewhat bipinnate; branches opposite, patent, almost simple; joints many times longer than broad; capsules pedicellate, unilaterial.—AGARDH, *Sp. Alg.* ii. 160. *fide* GREVILLE in *litt.* *Ceramium Turneri*, GREV. *Crypt. Fl.* t. 355. *Conferva Turneri*, DILLW. *Conf. p.* 79, t. 100. *Eng. Bot.* t. 2339.

Hab. Berwick Bay, parasitical on *Furcellaria lumbricalis*, in tufts about $\frac{3}{4}$ ths of an inch in height.

A rare and beautiful species, discovered, in the first instance, by DAWSON TURNER, Esq., one of the most distinguished of British botanists. I considered myself fortunate in finding it, in 1828, on our shore north of the Tweed, so that it may very properly be considered as an addition to the Scottish Flora.

3. *C. repens*, red, short, creeping; filaments capillary, branched; branches erect, alternate, patent; joints about thrice their diameter, alternately contracted when dry; partitions pellucid.—LYNGB. *Hydroph. Dan.* 128. t. 40. *Conferva repens*, DILLW. *Conf. 72*, t. 18. *Eng. Bot.* t. 1608.

Hab. Parasitical on *Furcellaria lumbricalis* and *Chondrus crispus*, covering the stems with a red rough velvety coating, not common.

This is also new to the Scottish Flora, but the acquisition has little beauty to recommend it.

4. *C. Rothii*, crimson, velvet-like, matted; filaments erect, slender, branched; branches erect, alternate, elongate, rather distant; articulations twice as long as broad, joints pellucid.—LYNGB. *Hydroph. Dan.* 129. t. 41. GREV. *Fl. Edin.* 312. *Conferva Rothii*, DILLW. *Conf. p.* 73, t. 73. *Eng. Bot.* t. 1702. *Ceramium Rothii*, HOOK. *Scot.* ii. 85.

Hab. On rocks, principally on sandstone, near high-water mark, abundant in Berwick Bay; also on a wall by the river side at Tweedmouth church.

“*C. Rothii* grows in patches of various sizes, generally, according to Dr ROTH, affecting an oblong form. The colour is a bright red, sometimes tending to brown, and changing, when dried, to a beautiful shining crimson; the filaments are very slender, frequently not more than three lines, and, I believe, never exceeding an inch in length; they are erect, densely matted together, and much branched; the branches dichotomous, alternate, and most numerous towards the apices; the joints are cylindrical, and their length is about equal to twice their thickness; the interstices pellucid.” These remarks from DILLWYN agree exactly with my own observations on this plant. It sometimes grows in places where it seems beyond the reach of the sea, except in spring tides; and at our river side, where it grows luxuriantly, it can only occasionally be washed with brackish water.

144. GRIFFITHSIA.

1. *G. setacea*, bright crimson, tufted; filaments capillary, branched; branches subdichotomous, erect-patent, long, straight, with joints five times their diameter. GREV. *Fl. Edin.* 312. *Conferva setacea*, DILLW. *Conf.* p. 74, t. 82.

Hab. Amongst sea refuse, in tufts about 1 or 2 inches in height on this coast, not uncommon.

The name of this genus is intended to commemorate Mrs GRIFFITHS of Devonshire, a lady whose discoveries are among the most important which have been made in marine botany.

145. TRENTEPOHLIA.

1. *T. pulchella*, reddish-brown, densely tufted; filaments much and irregularly branched; branches erect, straight, tapered at the ends, generally alternate, never opposite, with pellucid articulations 4 times their diameter.—LOUD. *Encyclop.* No. 15072. *Conferva nana*, Eng. Bot. t. 2585. opt.

Hab. On mosses in rapid streamlets. On *Hypnum riparium*, in the stream which runs through Lumsden Dean,

Berwickshire, in round dense tufts about half an inch in height.

2. *T. chalybæa*, blackish-green; filaments erect, very short, closely crowded, branched; branches erect, straight, alternate, somewhat fastigiate; articulations 3 times their breadth.—*Conferva chalybæa*, DILLW. *Conf.* p. 61, t. 91. *Ectocarpus chalybæus*, LYNGB. *Hydroph. Dan.* 133. t. 44.

Hab. On rocks in front of little cascades, covering them in broad irregular velvet-like patches. In the dean opposite Edrington-mill. Spring.

The filaments are pellucid under the magnifier, and distinctly jointed. The branches are alternate, most numerous towards the top, erect and rather close. My specimens were very exact to the figure and description of LYNGBYE, and while I agree with him in quoting the work of DILLWYN, I cannot consent to the opinion of those who consider this a mere variety of the preceding. The colour of the two is totally different; the one is much larger and tufted, the other is very short, and grows in patches; the one is the extraneous ornament of mosses and aquatic plants, the other invests stones and rocks, to which it adds no beauty.

146. AMPHICONIUM.

1. *A. aureum*, orange-coloured, cæspitose, short; filaments branched, entangled, somewhat rigid; branches spreading; articulations longer than broad.—SPRENG. *Syst. Veg.* iv. 344. *Byssus aurea*, LIGHTF. *Scot.* 1002. *Conferva aurea*, DILLW. *Conf.* 54. t. 35. and t. C *sup.* *Eng. Bot.* t. 212. *Ceramium aureum*, HOOK. *Scot.* ii. 86. *Ectocarpus aureus*, GREV. *Fl. Edin.* 315.

Hab. On moist sandstone rocks, not rare. At the side of the footpath leading through the plantation above Ord-mill. Ravine below Marshall Meadows.

DILLWYN says that *A. aureum* is generally to be found on calcareous rocks and in chalk-pits. In this neighbourhood it affects no rock but sandstone, which it covers in irregular tufts or patches, which bear a striking resemblance to a piece of orange-coloured velvet, and is a conspicuous and rather pretty object. When dried it retains its beautiful golden hue for some weeks, but ultimately changes to a dull ash-colour.

A little history of this alga, from one having authority in these matters, might afford a useful lesson; but our attempt will probably subject us to the charge of ignorance or of wilful blindness to the merits of our superiors. The plant was placed by LINNÆUS in his genus *Byssus*, which, we will admit, was made up out of somewhat heterogeneous materials, and could not of course be permitted to remain unaltered, when the fashion came to have all the members of a genus as like to one another as was Sebastian to Viola. And firstly, then, the subject of our story became a *Conferva*, a change of nomenclature which, as the consequence of some little additional acquaintance with its structure, was perhaps not to be found fault with; but scarcely was the name familiarized to us, until another change was deemed necessary to fit it for its proper place in the natural system. Could anything be more natural than to arrange a terrestrial, slightly organized, filamentous production among plants which are the natives of the sea, live constantly submerged, and possess a comparatively high and complex structure? Certainly not; and so our late *Conferva* was located amongst the *Ceramia*! Botany, however, has been said to be a progressive science; hence, in another year or so, a *Ceramium* this plant was not, and it figured next as an *Ectocarpus*. How many months or days it retained this appellation I do not know; it certainly in no long space of time was degraded to a synonym, and the very euphonical *Trentepohlia* usurped the higher station, too soon alas! to be displaced, or perhaps it ousted—for here my learning fails me—the little less euphonical *Amphiconium*. If the reader should ask a reason for my choice of this name in preference to the others, I might be puzzled for an answer,—a “sad choice led him perplexed;” and if I have erred, it may plead some palliation of the error to remember, that if a new name had been invented for the occasion, this little volume might have had a chance of being quoted in future by great botanists and in great books! But let not the reader suppose that *Amphiconium* is the latest *alias* for this plant; the name was used in a celebrated system of vegetables published in the year 1827, and botany, in its nature a progressive science, has fully participated in that improvement of all things, physical, political, and moral, which has distinguished the intermediate years. And it is now discovered, what indeed was always too obvious, that all the above-mentioned mutations in its nomenclature have not only not added one iota to our knowledge of the plant, either in structure or in its relations to other plants, but

have led to error and confusion. For in the "natural system" most approved of at present, this alga finds no place of rest among the Algæ, and is said to be a sort of mould, and figures away as an *Oxonium*, a genus which stands next to, and differs little from, the Linnæan genus *Byssus*!—The preceding sketch may appear, to the general reader, to be drawn up in the spirit of ridicule; but I am sorry to say that it is a true history, and only sins through defect, for at least one other synonym (*Dematium*) might have been added to the useless catalogue. HERSCHEL has asserted that "there is no science in which the evils resulting from a rage for nomenclature have been felt to such an extent as in mineralogy," but he would have divided the censure had he bestowed a passing thought on the labours of cryptogamic botanists.

2. *A. Linnæi*, reddish-orange, filaments very short, sparingly branched, erect, submoniliform.—SPRENG. *Syst. Veg.* iv. 345. *Chroolepus odoratus*, LOUD. *Encycl.* No. 15066.

Hab. On the bark of ash trees, not rare in this neighbourhood.

Forms orange-red undefined spots on the trunk of trees. The colour changes in the herbarium, after some time, to a greenish-yellow, when the plant exhales the odour of the sweet-violet.

147. CLADOSTEPHUS.

1. *C. spongiosus*, olive-brown, variously branched, densely beset with very short, scattered, incurved, slender, simple filaments; joints about as broad as long.—GREV. *Fl. Edin.* 313. HOOK. *Scot.* ii. 89. *Conferva spongiosa*, LIGHTF. *Scot.* 983. DILLW. *Syn.* 76. t. 42. *Eng. Bot.* t. 2427.

Hab. On rocks in tufts about 2 inches long, plentiful.

148. ECTOCARPUS.

1. *E. littoralis* capillary, olive-brown or green, excessively branched, bushy; branches either opposite or alternate with tapered points; articulations equal in length and breadth; tubercles globose, subsessile.—GREV. *Fl. Edin.* 314. *Conferva littoralis*, LIGHTF. *Scot.* 979. DILLW. *Conf.* p. 70. t. 31. *Ceramium littorale*, HOOK. *Scot.* ii. 86.

Hab. On rocks and algæ, very common, in flaccid tufts from 3 to 6 inches long, sometimes from the action of the water interwoven and twisted into woolly cords.

This species ascends our river for about half a mile, and increases chiefly in the summer season. Adheres to paper in drying. It is either very variable in colour and habit, or there are some other species confounded with it.

149. LEMANEA.

1. *L. fluviatilis*, dull green; filaments elongate, straight, attenuated, simple or sparingly branched, knotted; knots formed of 3 obscure tubercles.—Hook. *Scot.* ii. 84. *Conferva fluviatilis*, LIGHTF. *Scot.* 985. DILLW. *Conf.* t. 29. *Nodularia fluviatilis*, GREV. *Fl. Edin.* 300.

Hab. Rapid streams. In the Whiteadder about Ord-wheel, attached to stones, plentiful.

Grows in dense masses about 6 inches long. It is not lubricous, rather rigid, and has something of the habit of a Chara.

150. DICTYOSIPHON.

1. *D. fœniculaceus*, frond slender, olivaceous, much and irregularly branched; branches alternate, capillary, attenuate at the summits, spreading, covered with a fine filamentous fringe.—GREV. *Alg. Brit.* 56. *Conferva fœniculacea*, LIGHTF. *Scot.* 981. *Halymenia subtilis*, Hook. *Scot.* ii. 108.

Hab. In rocky pools about the coves near Berwick, plentiful. ☉

About a foot in length. I have a variety in which all the branches are remarkably curled; and another in which the frond is jointed like a Ceramium.

151. DUMONTIA.

1. *D. filiformis*, frond dull red or purple, gelatinous, membranaceous, round, irregularly branched; branches attenuate at the base, elongate, nearly simple, erect, obtuse, straight or flexuose.—

GREV. *Alg. Brit.* 165. *Ulva purpurascens*, WITH. iv. 142. *U. fastigiata*, WALKER'S *Essays*, 274.

Hab. On rocks in pools left by the tide, most abundant near high water mark. Berwick Bay. ☉

From 6 to 12 inches long, as thick as a goose-quill, of a soft consistence, being gelatinous internally. It imparts to fresh water a copious pink dye, and is apt to stain the paper, to which it adheres very closely, of the same colour.

“Bambergæ Northumbriæ cum essem, narrarunt mihi (*Rajo*) piscatores speciem quandam Algæ tinctoriæ in mari oram alluente copiose provenire, quæ piscium etiam transnantium tergora colore suo inficiat. Plantam ipsam non vidimus, sed ex eorum relatione algæ tinctoriæ J. B. affinem esse suspicabamur.”—RAII *Syn.* i. 51. Our fishermen of the present day have no such tales to tell.

152. CHORDA.

1. *C. Filum*, frond olive-green, cartilaginous, much elongated, attenuated at each extremity, the transverse septa not accompanied by external constriction.—GREV. *Alg. Brit.* 47. *Fucus Filum*, LIGHTF. *Scot.* 963. WITH. iv. 120. NEILL in *Edin. Encycl.* x. 19. *Chordaria Filum*, HOOK. *Scot.* ii. 98. *Scytosiphon filum*, GREV. *Fl. Edin.* 288.

Hab. Common on the coast. In the bay of Holy Island it attains a great length, 20 feet at least, waving under the water like long strings, and generally terminated with a tuft of parasitical conservæ. Summer. ☉

This cordlike sea-weed is hollow, but the cavity is interrupted at short intervals by transverse partitions, the use of which, according to Colonel STACKHOUSE, is to confine the air or elastic vapour to certain spaces, so as to increase the buoyancy of a plant which extends itself to an amazing length, and always shoots upwards to the surface.—“The stalks skinn’d when half dry, and twisted, acquire so considerable a degree of strength and toughness, that we are informed the Highlanders sometimes used them for the same intentions as Indian-grass.”—LIGHTFOOT. In Orkney it is accounted excellent for making kelp suited to the manufacture of soap.

153. ASPEROCOCCUS.

1. *A. echinatus*, frond tubular, membranous, olive or brownish green, somewhat transparent, even, attenuated at the base, about one foot in length.—GREV. *Alg. Brit.* 50. *Ulva fistulosa*, HOOK. Scot. ii. 92. *Fistularia attenuata*, GREV. *Fl. Edin.* 300. *Encoelium Lyngbyanum*, GREV. *Crypt. Fl.* t. 290.

Hab. Common on our wet shores attached to rocks. ☉

154. PUNCTARIA.

1. *P. plantaginea*, frond olive-brown, thin, lanceolate or linear-lanceolate, attenuated at the base, more or less waved, entire, dotted.—GREV. *Alg. Brit.* 53. *Ulva plantaginea*, WITH. iv. 136. *U. plantaginifolia*, GREV. *Fl. Edin.* 299.

Hab. On wet rocks in the bay below the Magdalen fields, abundant. Spring. ☉

Fronds tufted, about 6 inches long, generally roughened with young parasitical confervæ, or flocculent sordes.

155. ZONARIA.

1. *Z. deusta*, dark olive-green, coriaceous, circular, entire, obscurely zoned, adnate, bullate in the centre.—SPRENG. *Syst. Veg.* iv. 327.

Hab. On slaty and sandstone rocks near high water mark in Berwick Bay. ♀

Adheres closely to the rock, and spreads in a circular manner, but often rendered irregular by the inequalities of the surface beneath. I have seen a single frond fully a span in diameter, but generally it is much less. Upper surface smooth, somewhat waved, tubercular or bullate in the centre, blackish-green, and more or less distinctly zoned. Under surface brown, naked. Texture coriaceous, firm, opaque, rather brittle. The central part often dies away and falls out, leaving the circumference in the form of a circular band. Dr GREVILLE in a letter to me concerning this plant, says, "*Zonaria deusta* has a reddish colour which yours has not, and a corrugated burnt appearance, which yours has in a much less degree. I think that your plant may turn out to be my *Padina parvula* (*Zonaria par-*

vula, *Crypt. Fl.* t. 360.) in a mature state." To Dr GREVILLE's opinion much weight is due, but the differences pointed out between our plant and *Z. deusta* appear to me too slight to warrant their separation; nor can I think *Z. parvula* distinct.

156. ULVA.

* *Frond tubular.*

1. *U. intestinalis*, frond simple, round, elongate, membranaceous, green, inflated.—LIGHTF. *Scot.* 968. WITH. iv. 141. HOOK. *Scot.* ii. 91. *Fistularia intestinalis*, GREV. *Fl. Edin.* 300. *Enteromorpha intestinalis*, GREV. *Alg. Brit.* 179.

Hab. In the Tweed within tide-influence, plentiful in summer.

Varies very much in regard of size. Specimens are not uncommon nearly one yard long, which, when perfect and filled with water, resemble the intestines of an animal, whence the specific name; but in general it is much less than this. It often swims upon the surface of the water in clusters like a scum, and looks bloated as if in a state of fermentation.

2. *U. compressa*, frond green, branched, compressed, tubular; branches irregular, simple, attenuated at their base.—LIGHTF. *Scot.* 969. HOOK. *Scot.* ii. 91. *Fistularia compressa*, GREV. *Fl. Edin.* 300. *Enteromorpha compressa*, GREV. *Alg. Brit.* 180.

Hab. Sea shores and in the Tweed, abundant.

This and the preceding, during the summer months, fill the bed of the lower part of the river, and by clogging his nets, become a serious obstruction to the fisherman, who knows them by the name of *Slake*.

* * *Frond plane.*

3. *U. laciniata*, frond purple, umbilicate, sessile, spreading, torn into irregular segments and waved.—LIGHTF. *Scot.* 974. t. 33. *Porphyra laciniata*, GREV. *Alg. Brit.* 163.

Hab. On rocks, abundant. ☉

This is the true *Laver*, a vegetable in common use at the

tables of the great and rich in England and Ireland, but rarely eaten in Scotland, and never used in this town. I should suppose that the palate must be taught to acquire a relish for its peculiar flavour and glutinous quality. The daily use of it may be of service in scrofulous complaints, on account of the portion of iodine which it contains.

4. *U. latissima*, frond green, widely oblong or roundish, waved, membranous, thin.—GREV. *Alg. Brit.* 171. *U. lactuca*, LIGHTF. *Scot.* 970. HOOK. *Scot.* ii. 90. GREV. *Fl. Edin.* 299.

Hab. On rocks in the sea, common.

This is the *Green Laver* or *Oyster-green* known at table, but inferior to the preceding. GERARDE give us the origin of the latter name. "It is very well knowne euen to the poore oister-women which carry oisters to sell vp and downe, who are greatly desirous of the said mosse for the decking and beautifying of their oisters to make them sell the better. This mosse they doe call oister-greene."

5. *U. lactuca*, frond green, at first obovate, saccate, inflated, at length cleft down to the base, the segments plane, unequal, laciniated, semitransparent.—GREV. *Alg. Brit.* 172.; *Crypt. Fl.* t. 313.

Hab. In pools near high water mark, attached to sea-weed and stones. Berwick Bay, plentiful.

In its first stage this ulva resembles a Florence-flask in miniature, or rather the gall-bladder of quadrupeds, but it soon bursts, and becomes cleft in a very irregular manner. Notwithstanding the authority of Dr GREVILLE is against it, I am of opinion that this is a variety of the preceding.

6. *U. bullosa*, frond green, obovate, saccate, gelatinous, at length irregularly expanded, waved and bullate.—GREV. *Alg. Brit.* 174.

Hab. Fresh water ponds. Magdalen fields. Spring. ☉

Very lubricous, thin, and tender. It floats on the surface, being rendered buoyant by bubbles of air entangled in the fronds, when they appear, to use the apt comparison of DILLENUS, as if in a state of fermentation.

7. *U. crispa*, fronds crowded, deep green, rounded, inflated, much wrinkled and folded.—GREV. *Alg. Brit.* 175. LIGHTF. *Scot.* ii. 972. *Tremella terrestris*, DILL. *Musc.* 52. t. 10. f. 12.

Hab. On damp ground in shady places, and on thatched roofs, plentiful in and about Berwick. Winter and spring.

8. *U. calophylla*, fronds green, minute, tufted, linear, plane, flexuose, marked with longitudinal and parallel beaded lines of granules.—SPRENG. *Syst.* iv. 368. GREV. *Alg. Brit.* 176. *Bangia calophylla*, GREV. *Crypt. Fl.* t. 220.

Hab. On an old decayed piece of railing attached to a cot-house in the Greenses, Berwick.

I detected, not without a feeling of great pleasure and surprise, this remarkably beautiful alga while examining *Lyngbya muralis* under the microscope. The fronds vary greatly in their breadths, and are narrowed at the base. The figure of GREVILLE is admirable.

157. VAUCHERIA.

1. *V. terrestris*, matted, grass-green, the surface coarsely velvety or somewhat bristly; filaments irregularly branched, pellucid, or filled with a green matter; vesicles solitary, lateral, hemispherical, on a horn-shaped peduncle.—GREV. *Alg. Brit.* 191.

Hab. On the ground in damp shaded places, rare. Under shelving rocks on the coast, at the Coves. Spring.

2. *V. Dillwynii*, fine green, hirsute, matted; filaments rather short, irregularly branched, pellucid or filled with a granular matter; vesicles solitary, sessile, globose or ovate, lateral.—GREV. *Alg. Brit.* 191; *Fl. Edin.* 305. *Conferva frigida*, DILLW. *Conf.* t. 16.

Hab. At moist hedge bottoms in the earliest spring.

The vesicles are produced in great profusion, and I have seen them at least apparently supported on a very short pedicle.

3. *V. cæspitosa*, deep green, in dense spongy masses, the surface hirsute; filaments irregularly dichotomous; vesicles in terminal pairs, the summit of the peduncle projecting beyond them.—GREV. *Alg. Brit.* 194. HOOK. *Scot.* ii. 92. *Conferva amphibia*, DILLW. *Conf.* t. 41.

Hab. On the wood works of mill dams, and on banks exposed to the constant trickling of water, common.

“One of the most common species of the genus, inhabiting places where there is a constant supply of trickling moisture, especially upon a muddy or clayey surface. The masses which it forms often become pendant by their own weight, holding water like a sponge, and presenting the most beautiful green surface. Immediately beneath the surface, however, the filaments become pale, and at last colourless.”

—GREVILLE.

There is a *Vaucheria* very abundant in our ditches in spring, floating on the surface in large dense green or yellowish-green masses, where it is supported by the air entangled in its meshes. The filaments are long and coarse, simple or branched irregularly towards their top, often radiating at the margins, and turning whitish in decay. Not having found it in fruit, I am uncertain of the species. It is, however, the *Conferva furcata* of WITHERING, iv. 145; and is very well represented by DILLENIIUS in tab. 3. f. 10. of the *Historia Muscorum*.

4. *V. geminata*, green, in floating entangled masses; filaments dichotomously branched, slender; vesicles ovate, opposite, in pairs, attached by little partial stalks to the side of a horn-like common stalk.—GREV. *Alg. Brit.* 193. t. 19. f. 3. *Eng. Bot.* t. 1766.

Hab. In ditches near Berwick. Autumn.

In stubble fields in autumn I find a species which agrees with *V. geminata* in its fructification. The filaments are creeping, entangled, flexuose, sparingly and irregularly branched. The vesicles are globular, shortly pedicled, placed on the sides of a common stalk, the point of which rises up straight between them.

158. CONFERVA.

* *Filaments simple.*

1. *C. confervicola*, glaucous green; filaments unbranched, shortish, tufted, taper-pointed; articulations very short.—DILLW. *Syn.* 39. t. 8. and t. A. *Eng. Bot.* t. 2576.

Hab. Parasitical on *Gracillaria purpurascens* in numerous little scattered tufts. Berwick Bay.

2. *C. flacca*, bright green, tufted ; filaments unbranched, flaccid, equal, flexuose ; joints nearly twice as long as broad, their partitions pellucid.—DILLW. *Syn.* 53. t. 49. *Eng. Bot.* t. 1943.

Hab. Parasitical on fuci, particularly on *Fucus siliculosus*, in pencil-like tufts, about an inch long.

3. *C. flaccida*, olive-green, tufted ; filaments unbranched, flaccid, straight, tapering, with numerous articulations equal in length and breadth.—DILLW. *Syn.* 53. t. c. *Eng. Bot.* t. 2310.

Hab. On *Fucus vesiculosus* in short pencil-like tufts, frequent.

4. *C. fucicola*, yellow-brown ; filaments short, straight, simple, tufted ; articulations twice as long as broad.—GREV. *Fl. Edin.* 316. DILLW. *Syn.* 53. t. 66.

Hab. On *Fucus vesiculosus* in tufts of a dirty yellow or ochre colour, about an inch long.

5. *C. tortuosa*, green ; filaments simple, capillary, even, rather rigid, curled, twisted and entangled ; joints cylindrical, thrice as long as broad.—*Eng. Bot.* t. 2220. DILLW. *Syn.* 46. t. 46.

Hab. In pools of salt water at the highest water mark ; and on the margins of the Tweed within the influence of the tide.

In the water *Conf. tortuosa* appears like a flock of fine wool, but it is often left dry in wide masses, and may be taken up in large pieces. It is not lubricous, nor does it in general adhere to paper, but I have specimens which do so very closely ; and the latter, Mr ARNOTT informs me, agree with his authentic English ones.

6. *C. capillaris*, dark green, coarse, rigid ; filaments long, irregularly branched, the ultimate branchlets spreading, short, tapered ; articulations 3 times their diameter, with pellucid joints.—*Eng. Bot.* t. 2364. *C. crispa*, DILLW. *Syn.* 46. t. B. *C. rivularis* of AGARDH, according to Mr ARNOTT.

Hab. Small streams. In a little stream which runs through a wooded ravine between Ladykirk and Upsetlington, plentiful.

Grows in large masses, coarse and rigid to the touch. The filaments are as thick as ordinary sewing thread, attain

nearly a foot in length, are simple or sparingly branched ; the branchlets spiniform, irregular, patent, tapered. Does not adhere in the slightest degree to paper.

7. *C. rivularis*, darkish green ; filaments unbranched, very long, slender, clustered and twisted ; joints even, rather longer than broad.—*Eng. Bot.* t. 1654. *DILLW. Conf.* t. 39. *LIGHTF. Scot.* 976. *HOOK. Scot.* ii. 82.

Hab. Slow streams, not uncommon.

“*C. rivularis*, grows in very compact, silky, slender masses, of a dark green colour, frequently carried out to the length of 2 or 3 feet, and twisted by the action of the stream,”—*DILLWYN*.

8. *C. zonata*, bright shining green ; filaments unbranched, slender, slippery ; joints even, rather broader than long.—*DILLW. Syn.* 41. *Conf. lucens*, *Eng. Bot.* t. 1655. *DILLW. Conf.* t. 47.

Hab. In rapid streamlets, or on the front of rocks over which water falls, near Berwick.

9. *C. sordida*, yellowish-green, soft ; filaments unbranched, very slender, entangled in dense masses ; joints rather longer than broad, pellucid, as well as their partitions.—*Eng. Bot.* t. 2303. *DILLW. Syn.* 43. t. 60.

Hab. In ponds in spring.

The filaments are so fine, that, even when considerably magnified, they do not seem thicker than common sewing thread. They form a closely entangled mass, which at first floats round decayed straws and leaves, but ultimately forms large floating masses of a dirty yellow-green, very soft, but not lubricous.

* * *Filaments branched.*

10. *C. riparia*, yellowish-green, matted, not lubricous ; filaments capillary, long, sparingly branched ; branches mostly short and simple, very patent ; joints rather obscure, scarcely twice their diameter in length.—*DILLW. Syn.* 69. t. E. *Eng. Bot.* t. 2100. *C. obtusangula*, *LYNGB. Hydroph. Dan.* 159. t. 55.

Hab. On rocks, in wide patches, at the highest water mark, abundant in this neighbourhood.

11. *C. fracta*, green, much branched and entangled; branches scattered, divaricated; joints twice as long as broad, cylindrical.—*Eng. Bot.* t. 2338. *DILLW. Syn.* 65. t. 14. *Hook. Scot.* ii. 82.

Hab. In stagnant pools not uncommon, floating in densely entangled masses of a dull green colour.

The older authors, under the name of *Conferva bullosa*, united several species, which agreed in the common property of retaining bubbles of air within the meshes of their entangled filaments. *C. fracta* is one of these which have been used as wadding for stuffing garments, and wove into coarse household linen. *LIGHTFOOT* says he has also seen a coarse kind of paper made of it at Edinburgh.

12. *C. glomerata*, green, very much branched; branches alternate, clustered, pencil-shaped, the ultimate ones directed to one side; joints cylindrical, five times as long as broad, their partitions pellucid.—*Hook. Scot.* ii. 82. *GREV. Fl. Edin.* 313.

(a.) *Fluviatilis*, in running fresh water. *C. glomerata*, *LIGHTF. Scot.* 993. *DILLW. Syn.* 65. t. 13. *Eng. Bot.* t. 2192.

(b.) *Littoralis*, in pools of salt water. *C. læte-virens*, *DILLW. Syn.* 66. t. 48. *Eng. Bot.* t. 1854.

Hab. Rivulets, and the sea shore, abundant.

The bed of little rapid rivulets is frequently rendered green by the abundance of this species, which floats at the bottom in very dense masses from 6 to 12 inches in length. The sea variety, on this coast, rarely exceeds 3 inches, and it is more rigid and less deeply coloured. In drying, the plant scarcely adheres to paper.

13. *C. rupestris*, densely tufted, deep green, much branched; branches erect, rigid, straight, rather obtuse; joints 3 times as long as broad or more, the partitions pellucid.—*LIGHTF. Scot.* 994. *DILLW. Syn.* 65. t. 23. *Eng. Bot.* t. 1699. *Hook. Scot.* ii. 83.

Hab. On rocks between low and high water marks, very common.

Tufts from 2 to 4 inches long. In drying it retains its fine colour, and scarcely adheres to paper.

159. ZYGNEMA.

1. *Z. decimum*, green, soft, lubricous; filaments long, with

two spiral lines, forming by their intersections a diamond-shaped net-work; articulations always more than twice their diameter in length.—GREV. *Fl. Edin.* 320. *Z. nitidum*, HOOK. *Scot.* ii. 80. *Conferva nitida*, DILLW. *Syn.* 49. t. 4. *C. decimina*, DILLW. *Syn.* 49. *C. jugalis*, DILLW. *Conf.* t. 5.

Hab. Ponds, common in summer, floating in large masses.

2. *Z. quininum*, green, soft, lubricous; filaments long, with a single spiral line forming the letter V in its regular and close revolutions; joints obscure, twice their diameter in length.—HOOK. *Scot.* ii. 80. GREV. *Fl. Edin.* 320. *Conjugata porticalis*, VAUCH. *Conf.* 66. t. 5. f. 1. *Conferva spiralis*, DILLW. *Conf.* t. 3. *Eng. Bot.* t. 1656.

Hab. Ponds and ditches, very common in spring and summer, in very dark green masses.

The filaments in this are usually a third more slender than those of the preceding; and the joints are so obscure, that they were overlooked by the accurate MULLER, who first made the species known. Both plants make their appearance early in spring, forming, in ponds and ditches, large smooth dark-green masses of vegetation, agreeable enough to the eye, yet giving no visible sign of the beautiful and singular structure which the microscope proves them to possess. I have now very often examined it, and the pleasure of a re-examination continues unabated, although unmixed with the wonder and surprise which heightened the enjoyment of its first detection. It seems peculiar to the works of creation, that familiarity with their appearances creates no satiety. The filaments marked with their beaded spiral lines resemble miniature necklaces of fairy workmanship.

3. *Z. bipunctatum*, green, lubricous; filaments long, with joints two or three times longer than broad, each containing two stellated clusters of granules.—GREV. *Fl. Edin.* 320. *Conferva bipunctata*, DILLW. *Syn.* 50. t. 2. *Eng. Bot.* t. 1610.

Hab. In ditches and small ponds, common. Spring.

Floats in large masses, sometimes of a very deep green, but more commonly of a yellowish-green colour. The spots in the joints are at first globular or elliptical, but when perfect they separate to a short distance, and assume the starred character. "The space also that they occupy in

the joints is far from certain, for sometimes they fill nearly the whole, and at others only a small portion of them."

4. *Z. genuflexum*, yellowish-green, soft, matted; filaments slender, brittle, here and there bent and combined by their angles; joints 4 times their diameter, partly filled with a green mass and an interrupted single beaded line.—GREV. *Fl. Edin.* 320. *Conferva genuflexa*, DILLW. *Syn.* 51. t. 6. and t. c. *Eng. Bot.* t. 1914.

Hab. Moss pools on moors. Spring.

The beaded granules are immersed in the green matter of the articulations, each containing from 2 to 4 in a series. They are omitted in the figures referred to, though distinct enough under the magnifier, and well represented by VAUCHER in his admirable work on fresh water *Confervæ*, tab. 8. fig. 1–9. Many of the articulations are empty and pellucid. The filaments are straight until they form their junctions, when they become angled or kneed at irregular intervals.

The mode of reproduction in the *Zygnemæ* is as curious as their structure is interesting. In their progress towards maturity the spiral lines become more and more widely separate, and sometimes irregular; and at length two filaments unite themselves by means of short transverse tubes at distant and uncertain intervals. The spiral lines now lose their form, becoming in each joint one irregular green mass, which in this state passes from its containing joint into a corresponding one of the opposite filament through the connecting tube, so that the articulation of one filament is empty, and the other becomes filled with the contents of two. They remain thus for some time, when the filaments are destroyed or separate into small portions, leaving the green matter free from its envelopes. This matter is the seed, which, sinking to the bottom, remains there until the ensuing spring recalls it into life.

160. BATRACHOSPERMUM.

1. *B. moniliforme*, olive-green, very lubricous, bushy; branches alternate, spreading, tapered, whorled at every joint with dense tufts of dichotomous and moniliform filaments; seeds in clusters in the axils of the whorled filaments.—VAUCH. *Conf.* 112. t. 11. f. 1. and t. 1. f. 5. *Conferva gelatinosa*, *Eng. Bot.* t. 689. DILLW. *Syn.* 63. t. 32.

Hab. On stones in small clear rivulets. Lamberton Moor. Spring and summer.

In dark tufts about 2 inches long, floating with the stream, and so lubricous that it slips through the fingers, and is with difficulty retained. It mimics the water-milfoil in its appearance. “Rien ne manquerait à la beauté de cette espèce, si ses ramifications étaient assez grandes pour être aperçues à la vue simple, et si sa couleur était plus brillante. Elle flotte avec beaucoup de grâces dans les petits ruisseaux, où sa mobilité est si grande qu’on la prendrait au premier coup-d’œil pour un être animé. La durée de sa vie est d’environ une année : comme elle se multiplie dans tous les mois, ou la rencontre à peu près dans toutes les saisons.”—VAUCH.

2. *B. cœrulescens*, gelatinous, bluish-green, irregularly branched ; branches spreading, whorled with numerous tufts of many simple moniliform filaments.—MOUG. and NEST., No. 497.

Hab. In moss holes in peat bogs on Coldingham Moor, rare, floating on the surface.

Larger than the preceding, more diffused, and of a very beautiful blue colour.

161. DRAPARNALDIA.

1. *D. plumosa*, green, very lubricous, much branched ; main filaments beset with numerous alternate bushy branchlets, the ultimate ones subulate, erect, irregularly alternate, crowded.—HOOK. Scot. ii. 77. *Conferva mutabilis*, DILLW. Conf. 63. t. 12. *C. lubrica*, Eng. Bot. t. 2087, not good. *Batrachospermum plumosum*, VAUCH. Conf. 113. t. 11. f. 2.

Hab. In the troughs for watering horses near the 6-mile stone on the Ayton-road, in early spring.

The joints of the main filaments are longer than their diameter, pellucid, or marked with a faint green band. “Il est difficile d’imaginer un aspect plus élégant et plus gracieux que celui qu’elle présente au microscope.”—VAUCH.

162. LYNGBYA.

1. *L. muralis*, green, matted ; filaments simple, rather rigid, flexuose and entangled, marked with numerous close and tolerably

distinct partitions.—*Bot. Gall.* ii. 987. *Oscillatoria muralis*, Hook. *Scot.* ii. 79. GREV. *Fl. Edin.* 304. *Conferva muralis*, Eng. *Bot.* t. 1554. DILLW. *Conf.* 39. t. 7.

Hab. On damp walls and old wood works in wide green strata.

“Of all vegetable productions this is perhaps one of the most common upon damp walls, stones, and especially neglected shady gravel walks. The dark areas in which the inhabitants of crowded cities gasp for air, become verdant in the wet months of winter with this *Conferva*, whose effects on the atmosphere may perhaps be as beneficial as those observed by Dr PRIESTLEY in the species produced in corrupted water.”—SMITH.

163. BANGIA.

1. *B. fusco-purpurea*, filaments capillary, simple, straight, greenish-brown or purplish; granules arranged in transverse lines.—GREV. *Fl. Edin.* 301. *Alg. Brit.* 177. *Conferva fusco-purpurea et atro-purpurea*, DILLW. *Syn.* 54. t. 92. and t. 103. Eng. *Bot.* t. 2055.

Hab. On rocks at high-water mark, or even above it. Near the Coves, abundant.

Grows in smooth even layers, and much resembles human hair, a resemblance which it well preserves when dried. The filaments are of two kinds,—one larger, soft, and of a loose texture; the other of a darker colour, much slenderer, and marked with close set granules, arranged in regular transverse rows. There are two varieties on our coast; the first is olive or greenish-brown, with filaments about an inch long; the other is of a beautiful purplish-red colour when dried, and often exceeds 6 inches in length. The latter is the *Bangia atro-purpurea* of AGARDH, the *Codium violacea* of MOUGEOT and NESTLER, No. 895.; but, according to Dr GREVILLE, the characters which distinguish it from the first are not sufficient to constitute a species.

2. *B. Laminariæ*, olive-green; filaments tufted, short, simple, continuous, with minute grains disposed in transverse lines.—GREV. *Fl. Edin.* 302. LYNGB. *Hydroph. Dan.* 84. t. 24.

Hab. Parasitical on the frond of *Laminaria esculenta*, not common.

3. *B. Johnstoni*, "filaments entangled, green, containing a single series of four-parted granules."—GREV. *in litt.*

Hab. On slate rocks near Berwick, at high-water mark.

Forms a very thin light-green smooth stratum on the rocks.

164. SCHIZONEMA.

1. *S. Smithii*, tufted, olivaceous; filaments dichotomously branched, continuous; granules moniliform, arranged in parallel lines.—GREV. *Crypt. Fl.* t. 298. *Ulva fætida*, Eng. Bot. t. 2101.

Hab. On stones and sea-weed near high-water mark, in tufts from half an inch to upwards of an inch in height. Abundant in Berwick Bay. Spring. ☉

165. CHAETOPHORA.

* *Frond simple, globose.*

1. *C. marina*, frond irregularly globose, inflated, folded, olive-brown, smooth.—GREV. *Crypt. Fl.* t. 53.; *Fl. Edin.* 322. *Rivularia tuberiformis*, Eng. Bot. t. 1956. Hook. Scot. ii. 75. *Tremella difformis*, LIGHTF. Scot. 900.

Hab. On *Conservæ* and the smaller *Fuci* in Berwick Bay.

Varies considerably in size. The largest specimens are an inch in diameter, slippery, coriaceous, hollow within. The filaments are imbedded in the thickness of the walls, hyaline, dichotomously branched, the apices all terminating at the surface in dark club-shaped granules.

2. *C. tuberculosa*, green, globular, gelatinous, unequally tubercular; filaments very numerous, radiating, dichotomously branched; ultimate branches shorter, fastigate, tapered at the points.—SPRENG. *Syst. Veg.* iv. 371. *Rivularia tuberculosa*, Eng. Bot. t. 2366, very exact to our specimens.

Hab. In springs attached to foreign bodies. Longridge Dean.

In general about the size of a pea, but sometimes larger. The filaments are long, slender, pellucid, marked with a series of dark rather distant spots. The joints are scarce-

ly visible in the main filaments, but appear to be 4 times as long as broad; in the extreme branches they are more distinct and shorter.

* * *Fronde branched.*

3. *C. endiviæfolia*, frond green, much branched, compressed; branches roundish, obtuse.—SPRENG. iv. 371. LYNGB. *Hydroph. Dan.* 191. t. 65. *Rivularia incrassata*, Eng. Bot. t. 967.

Hab. In a pond at Scrammerston limekilns, on pieces of limestone and on dead shells.

Fronde green, much branched, compressed, gelatinous but firm; branches irregular, multified, roundish and obtuse towards the ends. The plant consists of a transparent firm jelly, on which the form depends, and in which are immersed very numerous confervoid filaments, jointed, branched and divaricate. These filaments are most crowded towards the ends of the branches, which in consequence are greenest; they become less numerous, and sometimes almost entirely disappear near the base of the frond, which is then colourless.

166. LINCKIA.

1. *L. atra*, frond globose, solid, very hard, blackish-green; filaments simple, straight, radiating, acuminate and fissured at the apex.—LYNGB. *Hydroph. Dan.* 195. t. 67. *Tremella hemisphærica*, LIGHTF. Scot. 900.

Hab. Sea-shores, attached to the branches of *Confervæ* and of the common *Coralline*. Berwick Bay.

Small, nearly globular, smooth, glossy dark green, filled with a lighter green parenchyma. It varies in size from that of the smallest pin's head to that of a small pea, and is with difficulty bruised under the finger, arising as much from its lubricity and coriaceous texture as from its hardness.

2. *L. dura*, blackish-green, smooth, lubricous, in subglobular, firm, nearly solid masses; filaments bundled, radiating, much cleft and attenuated at the ends, which are level-topped.—LYNGB. *Hydroph. Dan.* 197. t. 67. GREV. *Fl. Edin.* 322.

Hab. On stones in the beds of rivulets on moors ; and on the front of dripping rocks by the sea-shore, covering them for an inch or two in tuberculated patches.

On the shore below Gunsgreen there occurs what I consider to be a variety of this species. It covers, to a great extent, the bottom of rocky pools of brackish water at high-water mark, with an uneven coating of a dirty yellow colour, composed of wart-like tubercles adhering together. The upper surface is somewhat lubricous and smooth, the under uneven and green. It is fully $\frac{2}{10}$ ths of an inch thick, fleshy ; a section exhibits 2 or 3 strata of green and yellowish substance. The filaments are pellucid, numerous, radiating and tapered, apparently unjointed, laciniate at the apices.

167. NOSTOC.

1. *N. commune*, sessile, roundish, plaited, waved, olive-green.—*VAUCH. Conf.* 222. t. 16. f. 1. *Hook. Scot.* ii. 74. *Tremella Nostoc*, *LIGHTF. Scot.* 898. *Eng. Bot.* t. 461.

Hab. Spittal Links, and on sandy or gravelly ground in many places, in spring and autumn, after rainy weather.

“ The ancient alchemists termed this vegetable *the Flowers of Heaven*, and flattered themselves with the hopes of its proving an universal menstruum !” “ Infused in brandy, it causes a disgust to that liquor in those who drink of it,” says a pharmacologist ; and an excellent remedy, therefore, for the “ *Potatores summi*.”

168. COCCOCHLORIS.

1. *C. protuberans*, thick, irregularly lobed, very soft, green ; the granules elliptical.—*SPRENG. Syst. Veg.* iv. 373. *Palmella protuberans*, *GREV. Fl. Edin.* 323. ; *Crypt. Fl.* t. 243. f. 1.

Hab. On rocks covered with moss and lichens in heathy deans, not rare in this neighbourhood. *Aut.*

2. *C. radicata*, minute, globose, gelatinous, green, crowded and in contact so as to form a crust spreading irregularly ; granules elliptical.—*SPRENG.* iv. 372. *Palmella botryoides*, *GREV. Fl. Edin.* 323. ; *Crypt. Fl.* t. 243. f. 2.

Hab. On moist heathy banks amongst moss, frequent. *Aut.*

3. *C. vulgaris*, very green, widely spreading, the granules densely crowded, rounded, adhering together by fours.—*Chlorococcum vulgare*, GREV. *Crypt. Fl.* t. 262. *Lepraria botryoides*, HOOK. *Scot.* ii. 73.

Hab. Common on wood in moist places, which it covers with a very thin green coating, easily rubbed off, and staining the fingers.

4. *C. cruenta*, in diffuse irregular gelatinous purple spots, composed entirely of granules compacted together.—SPRENG. iv. 373. *Tremella cruenta*, Eng. Bot. t. 1800. *Palmella cruenta*, GREV. *Crypt. Fl.* t. 205.

Hab. Common about the lower parts of walls in damp situations in Berwick and Tweedmouth, during the wet wintry months.

This “forms broad indeterminate patches, of a deep rich purple, with a shining surface, as if blood or red wine had been poured over the stone or ground.” During dry weather it contracts, grows dull, and disappears, but after rain spreads again, resumes its sanguine colour, and becomes conspicuous even to vulgar gaze. Its history affords an easy explanation of a phenomenon considered supernatural by the monkish chroniclers. “In the plain near Hastings, where the Norman WILLIAM, after his victory, found King HAROLD slain, he built Battle-Abbey, which at last (as divers other monasteries) grew to a town enough populous. Thereabout is a place which after rain always looks red, which some have attributed to a very bloody sweat of the earth, as crying to heaven for revenge of so great a slaughter.”—*Notes to DRAYTON's Poly-olbion.*

5. *C. rupestris*, irregular, thickish, gelatinous, dirty yellow, or sometimes orange-yellow; surface very uneven; granules minute, globular.—SPRENG. iv. 373. *Palmella rupestris*, LYNGB. *Hydroph. Dan.* 207. t. 69.

Hab. On rocks over which water drips, frequent in this neighbourhood. On the rocks at the calcareous spring below Twizel-castle, Rev. A. Baird. On sandstone rocks below Marshall meadows.

Forms wide irregular patches, varying in colour from a dull dirty yellow to a reddish-orange,—the drier the situation the deeper the colour. The interior is white. The gra-

nules have often seemed to me surrounded with a pellucid ring.

169. OSCILLATORIA.

1. *O. violacea*, mass gelatinous, dark purple; filaments very slender, straight, without perceptible transverse striæ, laid on a thin compact greenish substratum.—*Conferva mucosa*, &c. DILL. *Hist. Musc.* 15. No. 4.

Hab. Rapid streams. On stones in the bed of a burn below the mansion house of Longformacus. July.

The synonym of DILLENIIUS has been usually quoted as belonging to the *Conferva violacea* or *alpina* of botanists, but the quotation has been made certainly without a critical examination of his description, which is, as is usual with him, very complete, and as accurate as could be done without the aid of a microscope. I have no doubt whatever of his plant being identical with the one before me, and I consider myself lucky in refinding and replacing in our systems a species which has been so long lost and misunderstood. It covers the stones in rivulets with thick smooth jelly-like patches as large as a man's hand, and of a purple or very dark green colour, the difference in hue depending on causes which could not be detected. The masses are soft and gelatinous, and have some resemblance to a piece of congealed blood. The specimens I collected were put into a glass of water for two days previous to their being examined; and they communicated to the water a deep purple tint, and gave out a strong animal putrid smell. On adding some diluted sulphuric acid to this tincture, the colour was removed, and the smell became ammoniacal. Adheres closely to paper in drying, and dyes it a very fine bluish-purple.

2. *O. viridis*, mass thin, gelatinous, verdigris-green; filaments short, very slender, straight, without perceptible striæ, woven into a compact thin bright-green stratum.—VAUCH. *Conf.* 195. t. 15. f. 7. *Osc. tenuis*, LYNGB. *Hydroph. Dan.* 88. *Oscillaria viridis*, Bot. Gall. ii. 993.

Hab. On mud in stagnant water. In the Low below Goswick. April.

Grows in irregularly circumscribed patches of a very fine green colour. To appearance it would dissolve into its

constituent elements on being touched; but, on the contrary, it lifts up in small pieces, for the filaments are felted together, and form a compact though gelatinous membrane. They are radiating, short, and so very slender, that, under a considerable magnifier, they seem not thicker than a hair, and present no appearance of striæ. They are well represented by VAUCHER. *Oscillatoria tenuis* of Dr GREVILLE is a different species.

3. *O. ochracea*, filaments simple, very slender, lying in a thick cloud-like ochraceous stratum.—GREV. *Fl. Edin.* 304. *Conferva ochracea*, DILLW. *Syn.* 55. t. 62.

Hab. In small and rather deep pools at the sides of bogs, frequent.

This species covers the bottom of the pool with a thick light ochre-coloured stratum, and throws up through the water flocculent and waved masses, mimicking the heavy clouds of our sky; and it may be as transient, for a slight agitation dissolves the brittle fabric, and diffuses it in muddy fragments through the water.

4. *O. limosa*, blackish-green, soft; filaments straight and even, very slender, rigid, without transverse striæ, radiating round the margins, but in the centre felted into a soft mass.—HOOK. *Scot.* ii. 79. *Conferva limosa*, DILLW. *Syn.* 38. t. 20.

Hab. On damp walls, near their base, in Berwick, and on the muddy edges of ditches.

On damp walls this forms an irregular blackish-green spot, and to discover its true form and appearance, it is necessary to place a piece on a plate covered with water, where, though apparently a shapeless mass, it will, in the space of a night, shoot out an immense number of short filaments radiating from the circumference, and forming a fine and not inelegant fringe. I have seen this fringe completed in less than an hour. The filaments are straight, pellucid, and crystalline, but I could not discover any striæ, perhaps from the weakness of my magnifiers.

The green scum which floats on the surface of stagnant pools and drains in spring is not a species of this genus, but is formed by a congeries of very minute globules, cohering together from close apposition, and not through the medium of any membrane or glutinous matter.

OBS.—Of the genera *Fragillaria* and *Diatoma*, I have observed several species, both on marine and fresh-water plants, but being unable to refer them with certainty to the species already described, I have deemed it the best plan to omit any description of them.

170. GOMPHONEMA.

1. *O. paradoxum*, filaments crowded, pellucid, branched, each branch terminating in a wedge-shaped yellowish body, containing several granules towards the centre.—GREV. *Syn.* 38. *Echinella paradoxa*, GREV. *Crypt. Fl.* t. 25.

Hab. On various small marine *Algæ*, very common in Berwick Bay.

2. *G. minutissimum*, filaments slender, branched, flaccid, tipped with two tubular bodies containing granules towards the middle.—GREV. *Crypt. Fl.* t. 244. f. 1.

Hab. In ponds and at the sides of still water, investing small roots, mosses, &c. with a dense wool-like covering of an ochraceous colour, common.

3. *G. geminatum*, filaments long, slender, entangled, branched, the branches tipped with two long tubular bodies containing granules.—GREV. *Crypt. Fl.* t. 244. f. 2.

Hab. In rivulets in deans. In the rivulet in Lumsden Dean, most abundant. June.

Dr GREVILLE's figure corresponds very exactly with our specimens, but they did not grow in round tufts; on the contrary, they formed a long densely hairy brown filament, probably influenced to assume this shape by the force of the current.

171. ECHINELLA.

1. *E. fasciculata*, bodies linear, rather acute at the apex, fasciculate, springing from a convex transparent base.—GREV. *Crypt. Fl.* t. 16. f. 1-3. ; and t. 298. f. 3. a.

Hab. On *Confervæ* in Berwick Bay. It is frequent on *Schizonema Smithii*.

2. *E. circularis*, bodies very minute, wedge-shaped, pellucid, obscurely marked, arranged in a more or less complete circular manner.—GREV. *Crypt. Fl.* t. 35.

Hab. On straws in ditches in early spring.

This forms a flocculent mass of a fawn colour on straws, along which it often extends for several inches. The bodies seem bound together by a tenacious transparent jelly, are exceedingly numerous, often separate, but as often placed close side by side, and so arranged as to form a portion of a circle, for I have never seen the circle complete. Our description, when compared with that of Dr GREVILLE, will be found in some respects different, but the peculiar form and disposition of the corpuscles seem sufficient to identify the species.

3. *E. truncata*, bodies long, linear, truncate at both ends.—*Exillaria truncata*, GREV. *Syn.* 37. *Echinella fasciculata*, var. β . GREV. *Crypt. Fl.* t. 16. f. 4.

Hab. On *Confervæ* in fresh water.

Grows separately or in clusters. I have often seen the bodies divided into equal halves by a longitudinal line.

4. *E. acuta*, bodies long, tapered at each end.—LYNGB. *Hydroph. Dan.* 209. f. 69.

Hab. On the stones and mud at the bottom of still water.

Covers the surface of the body on which it grows with a brown dense coating in wide irregular spots, easily dispersed or diffused through the water. The corpuscles are very numerous, translucent, without any markings. I observed it in great profusion during a whole spring in a rivulet in the immediate vicinity. Its increase was very rapid, but as the spring advanced, and the *confervæ* began to vegetate, it quickly disappeared. It agrees with the plant of LYNGBYE only in the size and shape of the granules, but in these doubtful vegetables they seem to afford the only certain characters.

5. *E. lunulata*, granules oblong, curved, slightly tapered at each end, marked in the middle with a dark line.

Hab. In streams, attached to other plants. Lumsden Dean. August.

The granules were woven into an irregular expanded ochre-coloured membrane. The figure which LYNGBYE has given of the granules of his *E. olivacea*, var. *dilutior*, tab. 70. c. fig. 4. answers to those of our species.

“Rerum Natura tota est nusquam magis quam in minimis.”

APPENDIX.

“Inest in explicatione Naturæ, insatiabilis quædam e cognoscendis rebus voluptas, in qua unâ, confectis rebus necessariis, vacui negotiis, honeste ac liberaliter possumus vivere.”—CICERO.

APPENDIX.

No. I.

CHARACTERS OF THE ADDITIONAL GENERA.

MONANDRIA—MONOGYNIA.

- 1.* **HIPPURIS.** *Calyx* a slight border. *Corolla* none. *Seed* inferior, naked. *Stigma* 1. (Aquatic. Leaves whorled.)

PENTANDRIA—DIGYNIA.

- 95.* **CICUTA.** *Fruit* nearly orbicular, heart-shaped at the base, with 6 double ribs. *Calyx* broad, acute, rather unequal. *Petals* ovate or slightly heart-shaped, nearly equal. *Styles* scarcely tumid at the base. *Floral receptacle* depressed, withering. *Flowers* uniform, nearly regular, united.

HEPTANDRIA—MONOGYNIA.

- 122.* **TRIENTALIS.** *Calyx* of 7 leaves. *Corolla* in 7 deep segments, equal and flat. *Capsule* of about 7 valves. *Seeds* tunicated.

OCTANDRIA—TETRAGYNIA.

- 128.* **ADOXA.** *Calyx* half inferior. *Corolla* in 4 or 5 segments. *Berry* invested with the calyx. *Seeds* 4, bordered.

DECANDRIA—MONOGYNIA.

- 129.* *ARBUTUS*. *Corolla* ovate, transparent at the base. *Berry* of 5 cells.

DIDYNAMIA—GYMNOSPERMIA.

- 169.* *NEPETA*. *Lower lip* numerously notched; *throat* bordered and reflexed at each side.

DIDYNAMIA—ANGIOSPERMIA.

- 186.* *LATHRÆA*. *Capsule* of 1 cell. A *gland* under the germen.

TETRADYNAMIA—SILIKUOSA.

- 204.* *HESPERIS*. *Pod* inaccurately quadrangular. *Stigma* nearly sessile, of 2 converging lobes. *Calyx* closed, with 2 protuberances at the base. *Seeds* not bordered.

SYNGENESIA—POLYG.-ÆQUALIS.

- 243.* *BIDENS*. *Receptacle* chaffy. *Down* rough with reversed prickles. *Calyx* of many parallel channelled scales. *Corolla* occasionally radiated. (Flowers discoid.)

CRYPTOGAMIA—MUSCI.

- 23.* *PTEROGONIUM*. *Fruit-stalks* lateral; *peristome* single, of 16 entire equidistant teeth; *calyptra* dimidiate.

No. II.

ADDITIONAL SPECIES.

HIPURIS.

1. *H. vulgaris*, stem erect, simple, jointed; leaves linear, about 8 in a whorl; flowers small, axillary, sessile.—*Mare's Tail*.

Hab. Stagnant waters. In the Leet below Belville farm, in the parish of Eccles, Rev. A. Baird. Lithtillum Loch and Ferneyrig Marsh, Mr R. D. Thomson. July. 7/

CHARA, (p. 1.)

3. *C. flexilis*, smooth, transparent, without prickles; whorled branches cylindrical, blunt, with a minute point, no internal partitions, some cloven; bracteas none. *Smooth Chara*.

Hab. Coldingham Lough. ☉

In his *Scottish Cryptogamic Flora*, tab. 339, Dr GREVILLE has delineated a species of Chara, which he names *C. aspera*. A plant answering to his figure and description, I gathered some years ago at the sides of the Lough on Holy Island; but since the true *C. hispida* is abundant in the middle of the pond, I can consider the former merely as the young of that species.

VERONICA, (p. 4.)

6.* *V. montana*, stem weak, hairy all round; leaves ovate-heart-shaped, serrated, on rather long stalks; clusters scattered, few-flowered; capsule much compressed, veined, broadly obcordate, the margin fringed; segments of the calyx obovate, hairy. *Mountain Speedwell*.

Hab. In the woods at Dunglass, near the river, Dr Parsons. Langton woods, abundant, Mr Thomas Brown. June. 7/

7.* *V. polita*, stem prostrate, hairy; leaves stalked, heart-shaped or ovate-heart-shaped, coarsely serrated; flower-stalks about the length of the leaves, curved when in fruit; segments of the calyx ovate, the larger often with 2 or 3 crenatures; corolla bright blue, veined, small; stamens blue; capsule very turgid, obsoletely keeled, pubescent, tipped with a short style; seeds about 9 in each cell, cupped.—Hook. *Brit. Fl.* i. 7.

Hab. Cultivated grounds. Near Gavington, plentiful, Mr Thomas Brown. June to Oct. ☉

Borders very closely upon *V. agrestis*, and the only good distinction between the two lies in the dark blue flower, and the many-seeded capsule of *V. polita*, whereas in *V. agrestis*

the flower is very pale blue or almost white, and the capsule has never more than 6 seeds in each cell. I cordially assent to the opinion of those who consider them varieties.

MELICA, (p. 11.)

1.* *M. nutans*, petals beardless; panicle close, drooping, nearly simple; flowers pendulous; spikelet with two perfect florets.—*Mountain Melic-grass*.

Hab. Mountainous woods. "Gateheugh, Berwickshire,"
Mr W. Baird. July. 2/

GALIUM, (p. 33.)

8. *G. boreale*, stem erect, somewhat downy, branched; leaves 4 in a whorl, ovate-lanceolate, 3-ribbed, smooth; flowers white, numerous, in a large panicle; fruit bristly.

Hab. Rocky shady places. Gateheugh, Mr W. Baird.
Bog south of Hardacres, near Eccles; and road-side
north of Hatchetneze, Coldstream, Mr R. D. Thomson.
Road-side half-way between Fishwick and West-Fish-
wick. July. 2/

POTAMOGETON, (p. 34.)

3.* *P. fluitans*, lower leaves lanceolate, pointed and membranous, with distinct ribs; upper elliptic-oblong, stalked, coriaceous, obtuse, floating.—*Floating Pond-weed*.

Hab. "Ferneyrig Marsh, in the parish of Eccles, plentifully," Mr R. D. Thomson. July—Aug. 2/

MYOSOTIS, (p. 45.)

1. *M. repens*, root fibrous; stem clothed with patent hairs, soft; leaves and calyx with erect appressed bristles; clusters leafy at the base; calyx-segments lanceolate, erect, rather long.—*M. caespitosa*, HOOKER in *Edin. New Phil. Journ.* Oct. 1828, p. 147.

Hab. Boggy places in deans, frequent. In the vale below Langley-ford, Northumberland. Horncliff dean, N. Durham. In the wooded dean above the Pease-bridge, near the burn, Berwickshire. June—July. 2/

Stem erect, 12–18 inches high, clothed with soft spreading hairs. Bristles on the leaves, flowering stems, flower-stalks and calyx appressed. Clusters leafy at the base, spreading. Flower-stalks patent or recurved, more than twice the length of the calyx, the segments of which are long, lanceolate and erect, scarcely patent. Flowers large and very beautiful, light azure-blue, pink in the bud. There is very commonly a solitary flower in the axil of the branches.

In the Journal quoted above, there is a good description of this *Myosotis* by Dr MURRAY, who at first considered it as a new species, but subsequently referred it to the *cæspitosa* of SMITH on the authority of Dr HOOKER. From that species, however, it is altogether distinct; and, if long observation of the living plants may warrant me to give an opinion, it is equally distinct from *M. palustris*,—an opinion in which I am supported by my friend the Rev. A. BAIRD, who has had opportunities of studying them in different localities. *M. palustris* is a succulent plant, decumbent at the base, of a dark green, liable to become blackish in drying, and generally covered with scattered appressed hairs, and when they are spreading, which is sometimes the case, they are more rigid and sparing than in *M. repens*. The clusters of flowers are few-branched, always leafless; the segments of the calyx very short and patent; but the corolla large, plane, and of a deep azure-blue. On the contrary, *M. repens* is erect, rather slender, taller, and of a lighter green, which it retains in drying, with the stem always densely clothed with woolly hairs. The cluster is more branched, and the flowers, although large, are smaller than those of the *palustris*, and of a very beautiful light azure colour, pink in the bud. The *M. cæspitosa* is well distinguished from either by its smoothness, its excessively branched panicle, and the smallness of its flowers, while the divisions of the calyx are as large as in *M. repens*. The latter Mr DOX was the first to notice, but it is still imperfectly understood, and is often confounded with *M. palustris*, a comparatively rare plant, and as I think of inferior beauty. I have to request the reader to erase *Myosotis sylvatica* from the first volume, for it is the *M. repens* which grows in the station assigned to the former species, and which, so far as I know, does not occur either in Berwickshire or N. Durham.

SYMPHYTUM, (p. 44.)

1. *S. officinale*, hirsute; stem branched, winged with the decur-

rent ovate-lanceolate leaves; clusters in pairs, revolute, the flowers stalked, unilateral; segments of the calyx somewhat spreading; corolla swollen, purple or buff-coloured.—*Common Comfrey*.

Hab. Banks of rivers and watery places, rare. “Lane towards the sea at Bamborough,” Mr W. Robertson. Banks of the Blackadder near Kyloe, sparingly, Mr Thomas Brown. Side of the Whiteadder, about half a mile from its mouth, with purple flowers. June. ½

The roots, which are black externally, yield a copious insipid mucilage, and in consequence were formerly in great estimation to “cense the brest from flegme, and cure the griefes of the lungs;” and to heal “all inward wounds and burstings.” A decoction of them is used by dyers to extract the colouring matter of gum-lac. The leaves give a grateful flavour to cakes and panada, and the young stem and leaves are excellent when boiled.—*WITHERING*.

CAMPANULA, (p. 46.)

2. *C. latifolia*, herb hispid, milky; stem unbranched, round, 2 or 3 feet high; leaves coarsely serrate, lower ones heart-shaped, acute, the upper ovate-lanceolate; stalks single-flowered; flowers large, suberect, blue or nearly white; fruit drooping.—*Giant Bell-flower*, or *Throatwort*.

Hab. Wooded deans. Wood south-west of Polwarth church, and Castle-Law woods, Mr R. D. Thomson. Langton wood and Lees' Cleugh, plentiful, Mr Thomas Brown. Woods above the Pease-bridge, abundant. Aug. ½

One of the greatest ornaments to the woods in the north of England and in Scotland, but unnoticed by any poet, so far as I know, except by Sir WALTER SCOTT, who, in his *Rokeby*, has once mentioned it.

—————“He laid him down,
Where purple heath profusely strown,
And *Throatwort* with its azure bell,
And moss and thyme his cushion swell.”

CANTO iii. 8.

VIOLA, (p. 64.)

1.* *V. odorata*, stem none; scions creeping; leaves heart-

shaped, nearly smooth, as well as their footstalks; calyx-leaves obtuse; lateral petals with a hairy central line.—*Sweet Violet*.

Hab. Banks of the Eye about half a mile above Netherbyres'-house, and apparently as perfectly native to the spot as *V. canina*, beside which it was growing, Rev. A. Baird. Near Chillingham, Mrs Langhorne. It is sometimes to be found naturalized at the sides of hedges in the vicinity of villages. April. ¼

“ The sun was shining through a vernal shower ;
 The garden smiled, array'd in fresher green ;
 With richer fragrance breathed the simple flower,
 That meekly veil'd its charms and bloom'd serene ;
 I stoop'd, and fondly look'd the leaves between,
 Resolved the bashful beauty's haunt to find ;
 With slender stalk and modest humble mein,
 I saw the floweret with its head reclined,
 Although in robes of richest hue array'd,
 The vulgar gaze it seem'd to hold in scorn ;
 With drooping head upon a green leaf laid,
 It breathed rich odours in the breeze of morn.”

The root is emetic ; the flowers and seeds are said to be mild laxatives. The petals give their colour freely to water, and afford a delicate and useful test of the presence of uncombined acids or alkalis, the former changing its blue to a red, and the latter to a green colour.

CICUTA.

1. *C. virosa*, smooth ; stem 2 or 3 feet high, hollow, furrowed ; leaves twice ternate, the leaflets linear-lanceolate, decurrent, serrated ; umbels large, stalked ; flowers white.—*Water Hemlock*.

Hab. Primsie Loch, Berwickshire, Mr R. D. Thomson.
 Aug. ¼

A very energetic poison, producing symptoms which resemble considerably those produced by the hydrocyanic acid. Many instances are recorded in which the roots, mistaken for parsnips, have been eaten with a fatal result. The plant is equally deadly to cattle of all kinds, except to the goat, which is said to eat it with impunity. LINNÆUS, in his *Flora Lap.* p. 76, gives an account of a disease which every spring, in the neighbourhood of Tornöa, carried off sometimes not less than an hundred oxen, and which he traced to the operation of this herb.

CENANTHE. (p. 48.)

2. *Æ. Phellandrium*, leaflets all uniform, with narrow wedge-shaped, cut, divaricated segments; fruit ovate, with 5 broad ribs, and narrow intermediate furrows, (2 or 3 feet high; flowers white, numerous.)—*Fine-leaved Water-dropwort*.

Hab. “Ferneyrig marsh, sparingly,” Mr R. D. Thomson.
July. ♂

VIBURNUM, (p. 50.)

2. *V. Lantana*, shrub; branches mealy; leaves heart-shaped, serrated, veiny, downy beneath; flowers white, in large dense cymes; berries black.—*Way-faring Tree*.

Hab. “At Sir John Hall’s, in Dunglass-Glen,” Dr Parsons. May.

SAMBUCUS, (p. 50.)

2. *S. Ebulus*, stem herbaceous; stipules leafy; leaflets lanceolate; cymes with 3 main branches; flowers purplish; berries black.—*Dwarf Elder*.

Hab. Waste grounds, generally near church-yards. Near Coldingham, Rev. A. Baird. At the church-yard of Longformacus. July. ♀

The properties of this unattractive and foetid plant, which, as GERARDE says, “is not a shrub, neither is it altogether an herby plant, but, as it were, a plant participating of both,” are similar to those of the common elder, but stronger and less manageable.

DROSERA, (p. 50.)

2. *D. anglica*, leaves radical, erect, linear-spathulate, obtuse, on long smooth stalks; seeds with a loose chaffy coat.—*Great Sundew*.

Hab. Turfy bogs, rare. Coldingham moor between Renton-Bell and the old post road to Edinburgh, Mr A. A. Carr. July—Aug. ♀

TRIENTALIS.

1. *T. europæa*, stem simple, slender, round, reddish, 4–6 inches high; leaves chiefly clustered at the top, obovate, pointed, tapering to a stalk at the base, obscurely crenate, light green tinged with brown, veined, the veins anastomosing at about a line from the margin; flowers 1 or 2, each raised from the bosom of the leaves on a slender stalk, cernuous in the bud, white tinged with pink, star-like, the petals 6 or 7, and the stamens and the calyx-segments corresponding in their numbers.

Hab. On the wooded and rocky hill above Hepburn, at Chillingham, plentiful; and on Hedge-hope, about half-way to the summit. June. 2/

“Inter omnes, quos vidi flores, omnium simplicissimus, seu rectius, maxime æqualis est flos hic gratissimus: calyx enim, corolla et stamina pari modo divisa sunt, figura gaudent simplicissima, et corolla, quod curiosum, omnino plana absque notabili tubo.”—“Nescio quænam gratia floris adeo percellat oculos, ut fere effascinare videatur visu contemplatorem suum; forte a symmetria, pulchritudinis omnis matre!”—LINNÆUS. It was after a long walk in company with my friend Mr WILLIAM BAIRD, that I first saw this flower, which LINNÆUS has praised not higher than its elegance and simplicity deserves, if I am to judge by my own feelings on the occasion,—feelings which may be thought childish and extravagant, and yet which many a wandering botanist, I trust, has experienced.

“A little while I stood,
Breathing with such suppression of the heart
As joy delights in; and with wise restraint
Voluptuous, fearless of a rival, eyed
The banquet,—or beneath the trees I sate
Among the flowers, and with the flowers I play’d!”

ADOXA.

1. *A. Moschatellina*, smooth, 3 or 4 inches high; leaves twice ternate, unequally lobed; flowers pale green, 5 in a head, 4 forming a cube and 1 terminal, erect.—*Tuberous Moschatell.*

Hab. Damp shaded places. In the wood above the Retreat, Berwickshire, abundant. April. 2/

“The flowers have an evident musky smell in the evening

or early in the morning, while the dew is on them: the lateral flowers have mostly their parts of fructification in fours, the terminal one in fives."—HOOKER.

ARBUTUS.

1. *A. Uva-ursi*, shrub ; stems procumbent ; leaves obovate, entire, smooth, evergreen ; flowers rose-coloured, in small terminal clusters ; berry globose, scarlet.—*Red Bear-berry*.

Hab. Dry heathy places. On the west side of Dirrington Law, plentiful, Mr Thomas Brown. June.

The berries of this shrub, for the knowledge of which as a native of Berwickshire I am indebted to Mr BROWN, are known to the common people in the west of the county by the name of *Rapperdandies*, and are eaten by them. They are dry, mealy, and austere ; left untouched by birds, according to SMITH, but, according to LIGHTFOOT and HOOKER, yielding excellent food for the moor-fowl. The leaves are astringent, and have been used by the tanner ; and they afford to the physician a medicine of some repute and efficacy in calculous and phthisical disorders.

PYROLA, (p. 92.)

3. *P. minor*, stamens regularly inflexed ; style the same length, straight ; stigma 5-lobed, pointless, without a ring ; cluster of many drooping flowers.—*Lesser Winter-green*.

Hab. Wood at Orange-lane ; and plantation to the north of Loch Lithtillum, abundant, Mr R. D. Thomson. Langton wood, Mr Thomas Brown. Blackadder plantations, abundant. Wooded banks of the Dye above Longformacus, where a single specimen was gathered by my friend Mr Weddell. July. 7

Root creeping ; leaves on triangular grooved stalks, roundish-ovate, crenate ; flower-stalks triangular or pentangular, straight, reddish ; flowers clustered, orbicular, white, tinged with pink, pendant on stalks shorter than the lanceolate bractæ ; filaments equal, inclined round the capsule, white, with orange-yellow pores ; style not longer than the anthers, straight, with a large dilated 5-lobed apex. The seeds of the *Pyrolæ* lie imbedded in a thick cottony material, consisting of short erect fibres, arranged

parallel and close to one another. When magnified, these fibres are nearly pellucid, linear-oblong, and membranous, not unlike the plants of the parasitical genus *Erineum*.

RESEDA, (p. 104.)

2. *R. lutea*, leaves deeply 3-lobed, lower ones pinnatifid, variable; calyx in 6 divisions; flowers buff-coloured; petals 6, variously lobed.—*Wild Mignonette*.

Hab. Waste places. Last summer I found two patches growing on Spittal links; and as the plant is not cultivated, it seems entitled to a place in our Flora. Aug.



SPIRÆA, (p. 107.)

2. *S. salicifolia*, shrub; leaves elliptic-lanceolate, unequally serrated, smooth; flowers rose-coloured, small, in elegant upright terminal clusters.—*Willow-leaved Spiræa*.

Hab. Marchmont woods, apparently quite wild, Mr R. D. Thomson. A common ornament of shrubberies, and, after all, a somewhat doubtful native. July.

ROSA, (p. 108.)

9. *R. cæsia*, fruit elliptical, smooth; flower-stalks smooth; calyx distantly and sparingly pinnate; prickles hooked, uniform; leaflets elliptical, somewhat doubly serrated, glaucous, hairy beneath, without glands.

Hab. On the bank at the road-side above Whiteadder-bridge. July.

A compact much branched shrub, about 3 feet high, remarkable for the peculiar greyness of its foliage. Branches smooth, more or less blistered and coloured, armed with scattered light brown very slightly curved prickles, often placed in pairs at the base of the young shoots. The leaves are altogether without glands; stalk downy, furnished with 2 or 3 prickles beneath; stipules oblong, with spreading points, smooth, veined, downy, and more or less glandular on the margins; leaflets 7 or 5, ovate, 1 inch long, $\frac{3}{4}$ ths broad, rugose, simply or irregularly serrated; upper surface smooth, or thinly covered with appressed hairs, the under one cæsious and hairy all over. Flowers

in threes, their stalks shorter than the bracteas, smooth, naked or slightly setigerous, glaucous; tube of the calyx urceolate, naked, glaucous; segments permanent, equal to the petals, 3 of them copiously pinnate, and all of them thickly covered with glands beneath. Petals white, sometimes slightly tinged with pink, obcordate. Styles hairy, columnar, the stigmas collected into a roundish head. The total absence of glands on the leaves distinguishes this from every variety of *R. tomentosa*.

RUBUS, (p. 108.)

7. *R. macrophyllus*, stem somewhat angular and furrowed; prickles uniform, few, small; leaves digitate, of 3 or 5 stalked elliptical or ovate leaflets, very large, thin, soft and pliant, green on both sides, hairy; panicle repeatedly divided, somewhat corymbose; petals white.—Hook. *Brit. Fl.* i. 247.

Hab. In deans, in shaded and rather moist situations. Near Houndwood. July, August.

8. *R. saxatilis*, stems herbaceous, ascending, slightly prickly, with prostrate runners; leaflets three; panicle with few flowers, small, greenish-white; calyx of the fruit converging, without prickles or glands; fruit red.—*Stone Bramble*.

Hab. Lees'-Cleugh, a wooded ravine near Langton Lees farm-house, plentiful, Mr Thomas Brown. June, July.

POTENTILLA. (p. 108.)

5. *P. argentea*, stem ascending; leaflets 5, wedge-shaped, jagged, white and downy beneath; flowers small, yellow, numerous, in a white cottony corymbose panicle.—*Hoary Cinquefoil*.

Hab. Road-side west of Stitchesell, not common, Mr R. Dundas Thomson. June, July. 2/

NEPETA.

1. *N. cataria*, whorls stalked, crowded into spikes; flowers very numerous, white, lower lip flesh-coloured, dotted with crimson; leaves finely downy, heart-shaped, stalked, with tooth-like serratures.—*Common Cat-mint*.

Hab. "Near Gateheugh, in the west of Berwickshire,"
Mr W. Baird. July. 7/

"The later herbarists do call it *Herba Cattaria*, and *Herba Catti*, because the cats are very much delighted herewith; for the smell of it is so pleasant to them, that they rub themselves upon it, and wallow or tumble in it, and also feed on the branches and leaves very greedily."—GERARDE. On this account it can only be preserved in gardens by sowing the seed, for, by the handling in the process of transplanting, or in the languid state subsequent to it, the peculiar scent is exhaled, and the cats are attracted to the plant, which otherwise they are unable to discover. "If you set it, the cats will eat it; if you sow it, the cats will not know it."

MENTHA, (p. 126.)

1. *M. viridis*, spikes interrupted: leaves sessile, lanceolate, acute, naked; bracteas bristle-shaped, somewhat hairy, as well as the teeth of the calyx; flower-stalks very smooth.—*Spearmint*.

Hab. At the sides of the Whiteadder above Gainslaw-ford, on the north side, in two or three large patches, and apparently perfectly wild. Aug. Sept. 7/

MELAMPYRUM, (p. 128.)

2. *M. sylvaticum*, leaves in distant pairs, entire; flowers axillary, turned to one side; corolla deep yellow, small, gaping, the lip deflexed; height about 1 foot.—*Wood Cow-wheat*.

Hab. Banks of the Dye above Longformacus, Mr Thomas Brown. July, Aug. 7/

My specimens from Mr BROWN agree entirely with the descriptions of authors, and also with authentic specimens of *M. sylvaticum*, with which they have been compared. I mention this the more particularly, because I am tolerably certain that, in the above station, it grows intermixed with the more common *M. pratense*. The latter, in addition to its other habitats, I may add, grows very abundantly in the woods between Houndwood and the Pease-bridge, and on some wooded parts of the banks of the Whiteadder between the Retreat and Elmford; but in no part of Berwickshire have I observed it to attain the size of the plant figured in *Eng. Botany*, and which I have gathered in the

woods at Roslin. Our plant is rarely above 6 inches, bushy, with narrow linear leaves, and very often with entire bracteas. My *Mel. montanum* (vol. i. p. 136.), I am now satisfied, is only an alpine state of this. It may be found in profusion on Hedgehope, one of the Cheviots, and on Hepburn-hill at Chillingham, but in the latter station the plant begins to assume the appearance of the true *pratense*.

LATHRÆA.

1. *L. squamaria*, flowering branches erect, simple; flowers axillary, unilateral, subpendulous; lower lip in 3 lobes. (tab. viii.)

Hab. Damp shaded woods, rare. In some natural wood above the Retreat plentiful. April. 7/

Roots fibrous. Stem subterraneous, irregularly branched; branches often clustered, short, obtusely pointed, covered with fleshy imbricated leaves, which in shape resemble a horse's-hoof in miniature. Flower-stalk or branch thick, succulent, 4-6 inches high, tapered upwards, purplish, downy, bearing a spike of crowded flowers of a pale purplish-pink colour, arranged in 4 rows, and all leaning to one side. Bracteas large, inversely heart-shaped, entire, cream-coloured, smooth, thin. Stalk of the lower flowers as long as the bractea; of the upper shorter, compressed, clothed with a soft glandulous down. Calyx cream-coloured, downy, cleft into 4 subequal segments. Upper lip of the corolla entire or merely emarginate, sprinkled over with a short glandulous down; lower lip 3-cleft. Filaments purplish-pink, smooth, with downy anthers. Style protruding, filiform, smooth, tubular, with a dilated stigma. Germen smooth. Gland semilunar, with an obtuse tooth, secreting at the base a sweetish fluid. Supposed to be parasitical, attaching itself to the roots of trees, but I could not trace the connection, perhaps from my time not permitting me to dig it up with sufficient care.

I have been particular in the description of this singular plant, for there are some particulars in which it differs from the plant of the *English Flora*. 1. The upper lip is not cloven; it is said in SMITH's description to be "deeply cloven." 2. The leaves are not ovate, as SMITH says they are. 3. The segments of the calyx are not smooth, for the whole calyx is covered with down. 4. The style projects considerably beyond the under lip, while in *Eng. Fl.* it is "scarcely the length of the corolla." 5. The nectary is not notched, for the centre rather projects.



HESPERIS.

1. *H. matronalis*, herb rough; stem erect, branched; leaves ovate-lanceolate, nearly sessile, coarsely toothed; flowers large, purplish-pink, on patent stalks; calyx slightly coloured, somewhat hairy, sometimes smooth; petals obovate, with a long linear claw; pods ascending, smooth, torulose, slender, attaining a length of $2\frac{1}{2}$ inches, and tipped with the large lobes of the style.—*Dame's Violet*.

Hab. In the bed of a rivulet between Burnhouses and Reston-mill, to all appearance truly wild. July. 2/

“It is thought to be the *Hesperis* of PLINY, so called, for that it smells more, and more pleasantly in the evening or night than at any other time.”—GERARDE. During the day the flowers have in fact no smell except in rainy weather.

GERANIUM, (p. 149.)

9. *G. phæum*, stalks two-flowered, panicled, erect; calyx slightly pointed; capsules keeled, hairy below, wrinkled at the summit; stamens hairy; flowers dark chocolate-coloured.—*Dusky Crane's-bill*.

Hab. Banks of the Eden near Stichell, Mr A. A. Carr. June. 2/

FUMARIA, (p. 154.)

3. *F. capreolata*, stem climbing by means of the twisting foot-stalks; leaflets wedge-shaped, lobed; cluster rather lax; pods single-seeded, globose, on stalks not longer than the bractes.—*Ramping Fumitory*.

Hab. Cultivated fields in hedges, frequent. June—Sept.



I had overlooked this as a large broad-leaved variety of *F. officinalis*, until my attention was more particularly directed to it by my friend Mr BAIRD. It is a much larger plant, and creeps up the hedges to the height of 3 or 4 feet. The flowers are large, with oval calycine leaves toothed at the base, entire above, and twice as long as the globose fruit, as Mr ARNOTT has correctly pointed out; and the brac-

teas are as long or longer than the pedicels, many of which, in our specimens, are recurved.

GENISTA, (p. 155.)

2. *G. anglica*, a neat thorny shrub, about a span high; thorns simple, none on the flowering branches; leaves ovate-lanceolate, small, smooth; flowers yellow, axillary; legume smooth.—*Petty Whin*.

Hab. Heaths, frequent. Coldingham Moor, Rev. A. Baird. Moor near Westruther, Mr J. Thomson. Occurs scattered over all the Lammermuirs. Doddington Moor; and on the moors between Wooler and Belford. June.
2/

TRIFOLIUM, (p. 155.)

The reader is requested to substitute for *T. officinale*, p. 162, the following:—

1. *T. leucanthum*, legumes 2-seeded, ovate, wrinkled; clusters lax, unilateral, greenish-white; corolla twice as long as the calyx, keel and wings shorter than the standard; stem erect.—*Melilotus leucantha*, HOOKER, *Brit. Fl.* i. 327.

Hab. Coupland plantations near Wooler, James Mitchell, Esq. R. N. The habitats given under *T. officinale* belong to this species. July.

Mr WINCH appears first to have noticed this plant in Britain.

“A variety bearing white blossoms has been observed by Mr WINCH growing on Willington Ballast, Durham; and on the Ballast-hills below Gateshead.”—WITHERING, *Bot. Arrang.* iii. 795, edit. 5th. It is not a rare plant in this neighbourhood, but, like the botanist just mentioned, I had failed to perceive the characters which separate it from *Trif. officinale*. The latter, so far as I know, has not been yet detected in Berwickshire.

TRAGOPOGON, (p. 170.)

For *T. pratensis*, described at p. 172, the reader will substitute—

1. *T. major*, “calyx more than half as long again as the corolla; leaves tapering, straight, sometimes slightly undulated; peduncles

swelling upwards, especially when bearing seed, fistular."—THOMSON *in litt.* SPRENG. *Syst. Veg.* iii. 663.

Hab. "Frequent on the banks of the Tweed at Birgham and Lennel, and in fields near Eccles," Mr R. D. Thomson. Frequent all over the east and north of Berwickshire and N. Durham, occurring at the sides of fields, in waste grounds, and also in Deans. June—Oct. 2/

Herb smooth, leek-green, abounding with a bitter milky juice. Root tapering. Stem 2 to 3 feet high, branched. Flowers, not including the involucre, about an inch in diameter, yellow, solitary, closing before noon. The boys in this neighbourhood chew the seeds before they have become hardened and mature.

For this very interesting addition to our wild plants, the botanist is solely indebted to Mr R. D. THOMSON, son of the Rev. Mr THOMSON of Eccles; and I have much pleasure in recording the discovery,—the more so as my young friend is a native of the county whose vegetable productions I have attempted to describe. Having satisfied himself that the species was distinct from *T. pratensis*, with which I had confounded it, Mr THOMSON stated his opinion, and carried a specimen to Dr HOOKER, who determined it to be without doubt the *T. major* of JACQUIN'S *Flora Austriaca*, and of SMITH in REES' *Cyclopaedia*. (HOOK. *in litt.*)

BIDENS.

1. *B. cernua*, leaves lanceolate, serrated; flowers drooping, yellow; bracteas nearly equal, entire; bristles of the seeds about four, erect.—*Nodding Bur-marigold*.

Hab. Ditches and ponds, very rare. Pond near Girtrigg on the farm of Ladyflat, Berwickshire, Mr Thomas Brown. Aug. Sept. ☉

The following remarks relative to this plant have been communicated to me by Mr BROWN. "Annual plants, it has been observed, produce in general more seed than perennial, and the reason is obvious. The *Bidens* is annual, and we might expect it to have the benefit of this provision, for indeed the circumstances of its growth seem to call for greater productiveness than is common even among annuals. It is found by the sides of ponds and ditches, and its seeds are thus even in danger of being blown either to the dry land or to the deeper parts of the pond. In either

case they must perish. On the dry land they are useless, for it is a water plant; and, on the other hand, if blown to the deeper parts, they will sink to the bottom, and never germinate, or germinate in vain. Now, though these seeds are exposed to so many dangers, and though the continuance of the species depends on their preservation, yet is their number by no means great. The flower-heads are small, and never numerous; the seeds large in proportion, and, of course, few are produced by a single plant. This apparent deficiency is, however, well compensated by a peculiar provision. The seeds are four-cornered, and the corners are furnished with sharp deflexed prickles. Each of these corners is also prolonged into an awn still more thickly set with prickles than the corner itself. Now, the intention of this conformation is obvious. The seed falls with the awns pointing upwards,—the prickles come into action, attach themselves to the various plants which float at or near the surface, and, becoming fixed, germinate in a favourable situation; for as the deflexed prickles fix to the first objects which they meet, the seeds are kept as near as possible to the stations of the old plants, and prevented from being carried either on shore or into places that are too deep. How well the prickles are fitted to perform their office may be gathered from a fact mentioned by LIGHTFOOT, that “the seeds of the *Bidens tripartita* have been known sometimes to destroy the *Cyprinus auratus* or goldfinch, by adhering to their gills or jaws.” So closely do they attach themselves to whatever they come in contact with! May not this structure of theirs also save them from the depredations of birds?

ORCHIS, (p. 190.)

6. *O. viridis*, knobs tapering, clustered, divided; lip of the nectary linear, with 3 teeth, the middle one smallest; spur very short, slightly cloven. (3 to 6 inches high; flowers greenish.)—*Frog Orchis*.

Hab. Heathy pastures. Amongst some natural wood opposite the village of Longformacus, in the west of Berwickshire; and on Doddington Moor, North Durham. July—Sept. 4

In both of the above stations a solitary specimen only could be found after a very diligent search,—a fact perhaps worth mentioning, because *O. viridis* in this respect differs from all our other species, which are social or gregarious plants.

EUPHORBIA, (p. 194.)

4. *E. esula*, umbel of numerous forked branches; bracteas nearly heart-shaped; all the leaves uniform, oblong-lanceolate, entire; nectaries rhomboid with two horns; capsule smooth.

Hab. Birgham Haugh, Mr R. D. Thomson. July. 2/

CAREX, (p. 195.)

24.* *C. riparia*, stigmas 3; catkins erect, cylindrical, acute, with taper-pointed scales; fruit ovate, smooth, tumid, with a cloven beak. (Stem 3 feet, acutely triangular, rough on the edges; leaves broad, long, rough-edged; bracteas foliaceous, very long, without sheaths; fertile catkins 3, stalked, large, the sterile ones 3 or more, sessile, subtriangular, acute, with long acutely pointed scales.)

Hab. Watery places. At the river side on Gainslawhaugh, plentiful, Mr John Barnes. May, June. 2/

SALIX, (p. 210.)

The reader is desired to erase *S. Andersoniana*, (p. 216.), and in its place to insert the following:—

13. *S. Forsteriana*, stem erect; branches minutely downy; leaves elliptic-obovate, acute, crenate, slightly downy, glaucous beneath; stipules vaulted; germen stalked, awl-shaped, silky; style as long as the blunt notched stigmas.

Hab. In a hedge near Mount-Pleasant, Durham. May.

POPULUS, (p. 211.)

4. *P. canescens*, leaves roundish, deeply waved, toothed, hoary and downy beneath; fertile catkins cylindrical; stigmas 8.—*Grey Poplar*.

Hab. In some natural wood on the banks of the Dye opposite the village of Longformacus, a small tree of this species was noticed, in the autumn of 1830, by the Rev. A. Baird and myself.

PTEROGONIUM.

1. *P. gracile*, stems creeping, matted; branches short, fascicled, somewhat curved; leaves small, ovate-acute, concave, serrated at the points, 2-nerved at the base, patent when moist, but when dry close and imbricated all round.

Hab. On the porphyry rocks in the deans about Wooler, abundant, but not in fruit.

ERINEUM, (ii. p. 208.)

7. *E. aureum*, saffron-yellow, in irregularly effused spots, sometimes spreading over the whole leaf, which is rendered bullate or distorted.—GREV. *Fl. Edin.* 449.; *Crypt. Fl.* t. 33.

Hab. On the leaves of the black poplar in summer, attacking both sides.

 No. III.

NOTICE OF SOME SPECIES WHICH ARE ADMITTED INTO THE ENGLISH FLORA, AND ARE MORE OR LESS NATURALIZED IN BERWICK-SHIRE AND N. DURHAM.

1. *DIPSACUS FULLONUM*—*Fuller's Teasel*. In the hedge of a cottage garden near Netherbyres, and in the hedge of the field adjoining, Rev. A. Baird.
2. *CORNUS SANGUINEA*—*Wild Cornel*. In shrubberies and in adjoining hedges, occasionally.
3. *PULMONARIA OFFICINALIS*—*Common Lungwort*. In gardens

frequent, and occasionally cast out with rubbish, to flourish by a hedge side for a season or two. The *Borago officinalis* and *Anchusa sempervirens* have no better claims to be considered indigenous in Berwickshire.

4. *POLEMONIUM CÆRULEUM*—*Jacob's Ladder*. Sometimes escapes from the garden in the same manner as the preceding, but does not spread in a wild state.
5. *VINCA MINOR*—*Lesser Periwinkle*. Naturalized in the woods about Drygrange, in the west of Berwickshire, Rev. A. Baird.
6. *RIBES RUBRUM*—*Red Currant*. In deans, on the sites of deserted mills and cottages.
7. *RIBES NIGRUM*—*Black Currant*. In similar places to the preceding.
8. *MYRRHIS ODORATA*—*Sweet Cicely*. Pinnaclehill near Kelso, Mr R. D. Thomson. Found by Mr Baird on the borders of Coldingham Moor, yet scarce run wild.
9. *LINUM USITATISSIMUM*—*Common Flax*. Cultivated in Berwickshire,—hence a stray specimen may occasionally be gathered in uncultivated places.
10. *GALANTHUS NIVALIS*—*Snowdrop*. Near Chillingham, Mrs Langhorne. In plantations about the residences of our gentry, but more seldom, and in less profusion, than the florist might desire.
11. *NARCISSUS PSEUDO-NARCISSUS*—*Common Daffodil*. Near Chillingham in profusion, Mrs Langhorne.
12. *TULIPA SYLVESTRIS*—*Wild Tulip*. Naturalized in the wood at Netherbyres, Rev. A. Baird.
13. *ACER PSEUDO-PLATANUS*—*Sycamore* or *Plane-tree*. From the size which many of these trees have attained in Berwickshire, it is obvious they agree well with our climate, although of foreign origin.
14. *ACER CAMPESTRE*—*Common Maple*. In the hedge between Longridge and Velvet-hall. Rare even in shrubberies and plantations in Berwickshire.

15. *OENOTHERA BIENNIS*—*Evening Primrose*. Planted on the banks of the Tweed below Milne-Graden,—“where many a garden flower grows wild.”
16. *TILIA EUROPEA*—*Lime-tree*. In plantations and parks.
17. *TILIA GRANDIFOLIA*—*Broad-leaved Lime-tree*. In the park at Nenthorn, with the preceding.
18. *HYPERICUM ANDROSÆMUM*—*Tutsan*. Birgham Haugh,—where it grew some years ago, but has now disappeared, Mr R. D. Thomson. It has been noticed by Mr Baird and myself in other parts of Berwickshire, but in every place too obviously the outcast of gardens.
19. *ANTHEMIS NOBILIS*—*Chamomile*. About Chirnside Bridge, not wild.
20. *FAGUS CASTANEA*—*Spanish Chestnut*. In plantations, common.
21. *CARPINUS BETULUS*—*Hornbeam*. In plantations, not common.
22. *HUMULUS LUPULUS*—*Common Hop*. In hedges about Paxton, naturalized.

No. IV.

ADDITIONAL HABITATS FOR SOME OF THE RARER SPECIES, WITH OCCASIONAL REMARKS.

- CIRCEA lutetiana*, p. 6. This occurs in most of the shaded deans in Berwickshire.
- VERONICA scutellata*, p. 7. Loch-Litthillum, and near Leitholm, Mr R. D. Thomson. On Langton Edge, in a ditch by the road-side from Dunse to Longformacus, abundantly, Mr Thomas Brown.

- UTRICULARIA vulgaris*, p. 8. Pond near Girtrigg in the parish of Langton, plentiful, Mr Thomas Brown.
- SCIRPUS sylvaticus*, p. 16. Sides of the Whiteadder, half way between its mouth and the bridge, Mr. A. Carr. In the Till at Wooler Bridge.
- MELICA uniflora*, p. 22. About the Pease Bridge, plentiful.
- TRITICUM caninum*, p. 32. In the woods above Netherbyres, plentiful.
- DIPSACUS sylvestris*, p. 35. In a wood between Cornhill and New Learmouth, N. Durham, Rev. A. Baird.
- SAGINA maritima*, p. 42. On the Farn Islands.
- ANCHUSA sempervirens*, p. 53. On hills of columnar greenstone to the north of Hume Castle, Mr R. D. Thomson.
- SYMPHYTUM tuberosum*, p. 53. Westruther, Mr James Thomson.
- VIOLA lutea*, p. 59. On the summit of Cockburn Law. (On the hills above Yetholm, Roxburghshire, abundant, where also I have seen the purple-flowered variety.)
- VERBASCUM Thapsus*, p. 59. Banks of Wooler Water, about half a mile above Middleton, evidently wild, Mr W. Baird. Twizel Castle, Mr R. D. Thomson.
- HYOSCYAMUS niger*, p. 60. North bank of the Tweed opposite Littledean Castle, Mr R. D. Thomson.
- ATROPA belladonna*, p. 60. Banks of a small rivulet which enters the Tweed above Horncliff, N. Durham, Mr A. A. Carr.
- EUONYMUS europæus*, p. 63. Wooded banks of the Whiteadder opposite Edrington-mill; and in Lumsden Dean, sparingly.
- ALLIUM oleraceum*, p. 77. In the woods at Netherbyres, Rev. A. Baird.
- SCILLA verna*, p. 77. Flowers in June on this coast.
- RUMEX sanguineus*, p. 82. Near Swinton-house, Rev. A. Baird. Langton woods, abundant, Mr Thomas Brown.

EPILOBIUM angustifolium, p. 86. Tweedside at Birgham, Mr R. D. Thomsom. Lumsden Dean.

VACCINIUM Vitis-idaea, p. 88. On the wooded rocky hill above Hepburn at Chillingham remarkably tall, but not abundant, Messrs W. Baird and Johnston. Banks of the Whiteadder above Abbey St Bathans, sparingly, Mr Thomas Brown. (The specimens gathered in this station are very bushy, with leaves much crowded.—See HOOKER, *Brit. Fl.* i. 178.) On Hedgehope, abundant. About the top of Dirrington Law, plentiful.

PYROLA rotundifolia, p. 93. Haiden Dean, abundant.

PYROLA media, p. 94. On the wooded and heathy bank above the school-house at Abbey St Bathans, most abundant. In Lumsden Dean.

DIANTHUS deltoides, p. 95. Very common in the west of Berwickshire, but rare on its eastern side, where, however, it occurs in tolerable abundance at St Helen's church, and in Lumsden Dean.

SILENE maritima, p. 96. The period at which this plant flowers is very erroneously given in the text, and the reader is requested to insert *June* for *Aug. Sept.* when only a few late specimens can be got in blossom. On the Farn Islands, as Mr W. Robertson has correctly remarked, it is very large, and assumes something of the habit of the common and much less beautiful *S. inflata*.

ARENARIA verna, p. 98. Spindlestone Craigs, Mr R. Embleton.

SEDUM villosum, p. 99. Boggy spots between Whitchester and Longformacus, plentiful; and on the top of a hill at the road-side about half way between Dunse and Longformacus, Mr Thomas Brown.

LYCHNIS diurna, p. 100. The fertile plant is, in general, much more robust and clumsy than the barren one; and the petals of the former have a large tooth at the sides, which those of the latter commonly want, their margins being entire. The difference between them is so considerable, that the plants can readily be distinguished at a distance; and though I do

not mean to say that these characters are constant, yet they are sufficiently so to deserve remark.

SEMPERVIVUM tectorum, p. 106. "The leaves of this familiar plant, vulgarly termed *Foox*, I have seen employed by the common people as an external application to corns, and I have been told that very considerable relief was experienced from their use." Mr R. D. Thomson.

ROSA rubiginosa, p. 112. On the banks of the Eden above Nenthorn, quite wild, and tolerably plentiful.

TORMENTILLA reptans, p. 116. Ferneyrig Bog, not common, Mr R. D. Thomson.

GEUM urbanum, p. 117. The variety of this species, which Erhart has considered distinct, and named *G. intermedium*, grows at hedge sides about Eyemouth, and in the dean below Dulaw, where it was pointed out to me by my friend the Rev. A. Baird.

CHELIDONIUM majus, p. 119. Road-side half a mile east of Coldstream, Rev. A. Baird. (Melrose Abbey.)

GLAUCIUM luteum, p. 119. Shore between Dunglass dean and the Coves, plentiful, Mr A. A. Carr.

NUPHAR lutea, p. 120. Pond at Kames, Mr R. D. Thomson.

CALTHA palustris, p. 125. Having tried the flower-buds as a substitute for capers, I can assert that they have no flavour of capers whatever, but are in truth very disagreeable; and the use of them may be hurtful, for the plant is possessed of acrid and poisonous properties. See CHRISTISON *on Poisons*, p. 448.

STACHYS palustris, p. 133. Mr Thomson has called my attention to a variety of this plant which he finds in the fields at Eccles, and which is common in this vicinity. It is distinguished by its leaves being supported on short stalks, and rather more hairy than usual; but possesses, as I think, no differential character of any importance. *S. palustris* has been lately cultivated as an esculent vegetable, and for having

suggested its use in this way, Mr Houlton received the silver medal from the Society of Arts. "It increases rapidly by creeping roots, and forms on these, during the summer, a number of thick, half-tuberous buds, from which the stems of the next year are to arise. From the end of autumn to the close of winter, these tuberous buds abound in a mild, somewhat sweetish, farinaceous matter, and are then fit for domestic use, being crisp, without fibre, and of a peculiar but scarcely perceptible flavour."

CARDAMINE pratensis, p. 143. I have noticed this flower to propagate itself in a manner of which there is not, I believe, another example to be found amongst native plants, but not uncommon with the succulent plants of hot-houses. In autumn little bunches of leaves may be seen to grow from the upper surface of the old but perfectly fresh leaves, and throwing out a radicle fibre, it creeps along to seek apparently a soil proper to take root in. These parasitical bunches are certainly young plants, and will detach themselves either when the root has reached and fixed itself in the soil, or when the parent leaf has decayed.

CARDAMINE amara, p. 144. In wet places about the base of Cockburn Law, plentiful. About the head of Langton wood, Mr Thomas Brown. In the Pease Glen, and in Dunglass dean, Rev. A. Baird.

GERANIUM lucidum, p. 151. Near Pinnaclehill, Kelso, Mr R. D. Thomson. On rocks by the side of the Whiteadder, on the south side of Cockburn Law.

MALVA moschata, p. 153. Road sides near Birgham, sparingly; and near Newton Don, plentiful, Mr R. D. Thomson. Langton woods, abundant, Mr Thomas Brown.

FUMARIA claviculata, p. 156. In the Pease Bridge dean on stony spots between the Forester's houses, plentiful.

ASTRAGALUS glycyphyllos, p. 161. In the ravine above Burnmouth, Mr A. A. Carr. Flowers in July and August.

GENISTA tinctoria, p. 158. Longridge Dean, Mr Thos. Brown. Near Whiterig, in the parish of Eccles, Rev. A. Baird.

ONONIS arvensis, p. 159. "The tender fibres of the root of this plant, called *Liquory-stick* by the Merse people, contain much saccharine matter, and when boiled with sugar, are used as a substitute for the Spanish liquorice of the shops, in coughs and colds." Mr R. D. Thomson.

VICIA lathyroides, p. 261. On the precipitous and dry rocky banks of Ale water, Berwickshire.

LEONTODON palustre, p. 174. Coldingham moor, abundantly; and not uncommon on other heaths in moist places.

CNICUS heterophyllus, p. 179. Langton Lees' Cleugh, Mr T. Brown. Banks of the Whiteadder above Claribad mill, Mr R. Dunlop.

SENECIO tenuifolius, p. 184. Road-side south of Orange-lane. On Hadden-rig, and near Anton's-hill, Berwickshire, Mr R. D. Thomson.

SENECIO viscosus, p. 184. Magdalen fields at the Cow-port, Mr A. A. Carr. In the wood above Netherbyres, Rev. A. Baird. Near Lumsden, and other places in Berwickshire.

CHRYSANTHEMUM segetum, p. 187. Very abundant among the corn in some of the fields at Greenhead in the parish of Coldingham, Mr Henderson, surgeon, Chirnside.

LISTERA cordata, p. 193. On Hedge-hope.

TYPHA latifolia, p. 197. Lithtillum Loch and Ferneyrig Bog, plentiful, Mr R. D. Thomson. In a pool by the side of the Whiteadder below Ewe-hole, Mr Henderson.

CAREX lævigata, p. 203. In moist places at the base of the wooded hill above Hepburn, N. Mr W. Baird.

QUERCUS sessiliflora, p. 207. The oak in the Pease Bridge dean is principally of this species.

SALIX alba, p. 218. The remark terminating the account of this tree is erroneous, for the fertile plant is not uncommon.

No. V.

THE FLORA OF BERWICK-UPON-TWEED, ARRANGED ACCORDING TO THE NATURAL SYSTEM.

(The numbers affixed to the genera express the number of species in each genus described in the work.)

I. DICOTYLEDONEÆ.

RANUNCULACEÆ—Thalictrum, 3. Anemone, 1. Ranunculus, 10.
Trollius, 1. Caltha, 1.

BERBERIDEÆ—Berberis, 1.

NYMPHÆACEÆ—Nuphar, 1.

PAPAVERACEÆ—Papaver, 3. Glaucium, 1. Chelidonium, 1.

FUMARIACEÆ—Fumaria, 3.

CRUCIFERÆ—Cheiranthus, 1. Nasturtium, 3. Barbarea, 2.
Arabis, 1. Cardamine, 3. Draba, 1. Cochlearia, 2. Thlaspi, 2. Teesdalia, 1. Cakile, 1. Hesperis, 1. Sisymbrium, 3.
Erysimum, 1. Senebiera, 1. Lepidium, 1. Brassica, 2.
Sinapis, 4. Crambe, 1. Raphanus, 1.

CISTINEÆ—Cistus, 1.

VIOLARIEÆ—Viola, 6.

RESEDACEÆ—Reseda, 2.

DROSERACEÆ—Drosera, 2.

POLYGALEÆ—Polygala, 2.

CARYOPHYLLEÆ—Dianthus, 1. Silene, 2. Lychnis, 3. Agros-

temma, 1. Sagina, 3. Spargula, 3. Stellaria, 5. Arenaria, 6. Cerastium, 5.

LINEÆ—Linum, 1. Radiola, 1.

MALVACEÆ—Malva, 3.

HYPERICINEÆ—Hypericum, 5. Parnassia, 1.

GERANIACEÆ—Geranium, 9. Erodium, 1.

OXALIDEÆ—Oxalis, 1.

CELASTRINEÆ—Euonymus, 1. Ilex, 1.

LEGUMINOSÆ—Ulex, 1. Genista, 2. Spartium, 1. Ononis, 1. Anthyllis, 1. Medicago, 2. Trifolium, 9. Lotus, 2. Astragalus, 2. Vicia, 6. Ervum, 1. Lathyrus, 1. Orobus, 2.

ROSACEÆ—Prunus, 3. Spiræa, 2. Geum, 2. Rubus, 8. Fragaria, 1. Potentilla, 5. Tormentilla, 2. Comarum, 1. Agrimonia, 1. Alchemilla, 2. Poterium, 1. Rosa, 9. Mespilus, 1. Pyrus, 2.

ONAGRARIÆ—Epilobium, 7. Circeæ, 1.

HALORAGÆÆ—Myriophyllum, 1. Callitriche, 2.

HIPPURIDEÆ—Hippuris, 1.

LYTHRARIÆÆ—Lythrum, 1.

PORTULACEÆ—Montia, 1.

PARONYCHIEÆ—Scleranthus, 1.

CRASSULACEÆ—Rhodiola, 1. Sedum, 5. Sempervivum, 1.

GROSSULARIÆÆ—Ribes, 1.

SAXIFRAGÆÆ—Saxifraga, 2. Chrysosplenium, 1. Adoxa, 1.

UMBELLIFERÆ—Daucus, 1. Torilis, 2. Heracleum, 1. Angelica, 1. Bunium, 1. Pimpinella, 1. Sium, 3. Ligusticum, 1. Cnidium, 1. Ægopodium, 1. Æthusa, 1. Cœnanthe, 2. Cicuta, 1. Chærophyllo, 1. Anthriscus, 1. Scandix, 1. Myrrhis, 1. Smyrnum, 1. Conium, 1. Sanicula, 1. Hydrocotyle, 1.

CAPRIFOLIACEÆ—Hedera, 1. Cornus, 1. Sambucus, 2. Viburnum, 2. Lonicera, 1.

RUBIACEÆ—Galium, 8. Asperula, 1. Sherardia, 1.

VALERIANEÆ—Fedia, 1. Valeriana, 2.

DIPSACEÆ—Scabiosa, 3. Dipsacus, 1.

COMPOSITÆ—Eupatorium, 1. Tussilago, 2. Senecio, 5. Aster, 1. Erigeron, 1. Solidago, 1. Bellis, 1. Inula, 1. Gnaphalium, 5. Chrysanthemum, 2. Pyrethrum, 3. Anthemis, 1. Achillea, 2. Artemisia, 4. Tanacetum, 1. Bidens, 1. Arc-tium, 2. Onopordum, 1. Carduus, 4. Cnicus, 4. Centau-rea, 2. Carlina, 1. Sonchus, 2. Lactuca, 1. Lapsana, 1. Crepis, 1. Leontodon, 2. Picris, 1. Hieracium, 6. Hy-pochæris, 1. Tragopogon, 1. Apargia, 2. Cichorium, 1.

CAMPANULACEÆ—Campanula, 2.

VACCINEÆ—Vaccinium 3.

ERICINEÆ—Empetrum, 1. Pyrola, 3. Arbutus, 1. Erica, 2. Calluna, 1.

JASMINEÆ—Ligustrum, 1. Fraxinus, 1.

GENTIANEÆ—Menyanthes, 1. Gentiana, 2. Erythræa, 2.

CONVOLVULACEÆ—Convolvulus, 2.

BORAGINEÆ—Echium, 1. Lithospermum, 1. Symphytum, 2. Lycopsis, 1. Anchusa, 1. Borago, 1. Asperugo, 1. Myo-sotis, 5. Cynoglossum, 1.

SOLANEÆ—Solanum, 1. Atropa, 1. Hyoscyamus, 1. Verbas-cum, 2.

ANTIRRHINEÆ—Digitalis, 1. Antirrhinum, 2. Scrophularia, 1.

OROBANCHEÆ—Lathræa, 1.

RHINANTHACEÆ—Melampyrum, 2. Pedicularis, 2. Rhinan-thus, 2. Bartsia, 1. Euphrasia, 1.

VERONICEÆ—Veronica, 12.

LABIATÆ—Salvia, 1. Ajuga, 1. Teucrium, 1. Marrubium, 1. Ballota, 1. Betonica, 1. Galeopsis, 2. Lamium, 4. Ne-peta, 1. Stachys, 3. Glechoma, 1. Mentha, 6. Thymus, 1. Clinopodium, 1. Origanum, 1. Prunella, 1. Scutellaria, 1.

LENTIBULARIÆ—Pinguicula, 1. Utricularia, 1.

PRIMULACEÆ—*Lysimachia*, 2. *Anagallis*, 2. *Trientalis*, 1. *Primula*, 2. *Glaux*, 1. *Samolus*, 1.

PLUMBAGINEÆ—*Statice*, 2. *Littorella*, 1.

PLANTAGINEÆ—*Plantago*, 5.

CHENOPODEÆ—*Salicornia*, 1. *Salsola*, 1. *Chenopodium*, 5. *Atriplex*, 3.

POLYGONEÆ—*Rumex*, 6. *Polygonum*, 6.

THYMELEÆ—*Daphne*, 1.

EUPHORBIACEÆ—*Euphorbia*, 4. *Mercurialis*, 1.

URTICEÆ—*Parietaria*, 1. *Urtica*, 2.

AMENTACEÆ—*Ulmus*, 1. *Betula*, 1. *Alnus*, 1. *Salix*, 18. *Populus*, 4. *Fagus*, 1. *Quercus*, 2. *Corylus*, 1.

MYRICEÆ—*Myrica*, 1.

CONIFERÆ—*Taxus*, 1. *Juniperus*, 1. *Pinus*, 1.

II. MONOCOTYLEDONEÆ.

ALISMACEÆ—*Alisma*, 2. *Triglochin*, 2.

POTAMEÆ—*Potamogeton*, 8. *Zanichellia*, 1. *Zostera*, 1.

ORCHIDEÆ—*Orchis*, 6. *Listera*, 3. *Epipactis*, 1.

IRIDEÆ—*Iris*, 1.

ASPARAGEÆ—*Convallaria*, 1.

LILIACEÆ—*Scilla*, 2. *Allium*, 5.

JUNCEÆ—*Narthecium*, 1. *Juncus*, 9. *Luciola*, 4.

AROIDEÆ—*Arum*, 1.

TYPHACEÆ—*Typha*, 1. *Sparganium*, 2.

CYPERACEÆ—*Schœnus*, 1. *Eleocharis*, 1. *Scirpus*, 8. *Eriophorum*, 3. *Carex*, 28.

GRAMINEÆ—*Nardus*, 1. *Phalaris*, 2. *Phleum*, 2. *Alopecurus*, 2. *Agrostis*, 2. *Aira*, 6. *Holcus*, 3. *Melica*, 3. *Glyceria*, 4. *Poa*, 3. *Triodia*, 1. *Briza*, 1. *Dactylis*, 1. *Cynosurus*, 1. *Festuca*, 9. *Bromus*, 3. *Avena*, 4. *Arundo*, 2. *Lolium*, 3. *Hordeum*, 2. *Triticum*, 3.

LEMNACEÆ—*Lemna*, 2.

III. ACOTYLEDONEÆ.

CHARACEÆ—Chara, 3.

EQUISETACEÆ—Equisetum, 6.

FILICES—Botrychium, 1. Polypodium, 3. Aspidium, 6. Cystea, 1. Asplenium, 4. Scolopendrium, 1. Blechnum, 1. Pteris, 2.

LYCOPODIACEÆ—Lycopodium, 4.

MUSCI—Polytrichum, 8. Bartamia, 3. Funaria, 1. Bryum, 14. Anomodon, 1. Fontinalis, 1. Hookeria, 1. Hypnum, 39. Pterogonium, 1. Tortula, 7. Didymodon, 2. Dicranum, 12. Weissia, 3. Encalypta, 1. Cinclidotus, 1. Trichostomum, 5. Grimmia, 3. Orthotrichum, 8. Tetraphis, 1. Splachnum, 1. Anictangium, 1. Gymnostomum, 4. Sphagnum, 3. Phascum, 3. Andræa, 1.

HEPATICÆ—Jungermannia, 27. Marchantia, 1. Anthoceros, 1. Riccia, 1.

LICHENES—Endocarpon, 1. Gyrophora, 2. Peltidea, 3. Nephroma, 1. Sticta, 2. Parmelia, 9. Collema, 3. Evernia, 1. Borreria, 3. Cetraria, 2. Ramalina, 4. Usnea, 1. Cornicularia, 2. Alectoria, 1. Sphærophoron, 2. Cenomyce, 8. Isidium, 1. Bœomyces, 1. Opegrapha, 5. Arthonia, 2. Verrucaria, 2. Lecidea, 12. Lecanora, 7. Porina, 1. Variolaria, 1. Spiloma, 1. Lepraria, 3.

HYPOXYLA. Sphæria, 57. Dothidea, 5. Hysterium, 8. Phacidium, 3. Rhytisma, 2. Ceuthospora, 1. Xyloma, 8.

FUNGI—Dacrymyces, 2. Tremella, 4. Cenangium, 1. Peziza, 19. Morchella, 1. Leotia, 1. Typhula, 1. Clavaria, 7. Auricularia, 4. Hydnum, 2. Boletus, 4. Polyporus, 8. Cantharellus, 2. Agaricus, 52. Phallus, 1.

LYCOPERDACEÆ—Scleroderma, 1. Lycoperdon, 4. Onygena, 1. Arcyria, 1. Stemonitis, 1. Leocarpus, 1. Craterium, 1. Trichia, 3. Physarum, 1. Lycogola, 3. Cyathus, 1. Rhizomorpha, 3. Erysiphe, 8. Sclerotium, 6. Illosporium, 1.

UREDINEÆ—Tubercularia, 3. Podisoma, 1. Stilbospora, 4. Septaria, 1. Puccinia, 24. Uredo, 38. Æcidium, 19.

MUCÆDINEÆ—Erineum, 7. Mucor, 2. Aspergillus, 1. Penicillium, 1. Botrytis, 2. Sepedonium, 1. Fusidium, 1. Racodium, 1. Cladosporium, 1. Torula, 1. Acrosporium, 1. Byssus, 1. Himantia, 1.

ALGÆ. *Fucaceæ*—Fucus, 5. Desmarestia, 1. Furcellaria, 1. *Laminariæ*—Himanthalea, 1. Laminaria, 5. *Floridæ*—Dumontia, 1. Halymenia, 8. Delesseria, 3. Odonthalia, 1. Chondrus, 2. Lichina, 2. Gelidium, 1. Plocamium, 2. Lomentaria, 2. Laurencia, 1. Gigartina, 3. Polyides, 1. *Dictyoteæ*—Zonaria, 1. Asperococcus, 1. *Ulvaceæ*—Dictyosiphon, 1. Chorda, 1. Dumontia, 1. Ulva, 8. Punctaria, 1. *Chetophoroideæ*—Nostoc, 1. Linckia, 2. Chætophora, 3. Coccochloris, 5. *Ceramieæ*—Cladosephus, 1. Rhodomela, 2. Polysiphonia, 8. Ceramium, 4. Asperocaulon, 1. Griffithsia, 1. Callithamnion, 4. Ectocarpus, 1. Amphiconium, 2. Trentepohlia, 2. *Vaucheriæ*—Vaucheria, 4. *Zygnemeæ*—Zygnema, 4. *Conserveæ*—Lemanea, 1. Batrachospermum, 2. Draparnaldia, 1. Conferva, 13. *Bangieæ*—Bangia, 3. Schizonema, 1. *Lyngbyeæ*—Lyngbya, 1. *Bacillariæ*—Echinella, 5. Gomphonema, 3. *Oscillariæ*—Oscillatoria, 4.

No. VI.

A COMPARATIVE TABLE OF THE PHÆNOGAMOUS
PLANTS AND FERNS OF GREAT BRITAIN, ENG-
LAND, SCOTLAND, AND BERWICK.

I. DICOTYLEDONES.	Brit.	Eng.	Scot.	Ber.
Ranunculaceæ,	36	35	28	16
Berberideæ,	2	2	2	1
Nymphæaceæ,	3	3	3	1
Papaveraceæ,	11	10	7	5
Fumariaceæ,	6	6	4	3
Cruciferae,	72	68	57	32
Cistineæ,	5	5	1	1
Violariæ,	8	8	7	6
Resedaceæ,	3	3	2	2
Droseraceæ,	3	3	3	2
Polygalæ,	1	1	1	1
Frankeniaceæ,	2	2	0	0
Caryophyllæ,	58	50	47	29
Lineæ,	5	5	3	2
Malvaceæ,	6	6	5	3
Tiliaceæ,	3	3	2	2
Hypericineæ,	11	9	11	7
Acerineæ,	2	2	2	2
Geraniaceæ,	16	16	13	10
Balsamineæ,	1	1	1	0
Oxalideæ,	2	2	2	1
Celastrineæ,	3	3	2	2
Rhamneæ,	2	2	2	0
Leguminosæ,	69	66	45	31
Rosaceæ,	82	72	63	40
Cucurbitaceæ,	1	1	1	0
Onagrariæ,	13	12	11	8
Halorageæ,	5	5	3	3
Hippurideæ,	1	1	1	1
Ceratophyllæ,	2	2	1	0
Lathrariæ,	3	3	2	1
Tamariscineæ,	1	1	0	0
Portulaceæ,	1	1	1	1
Paronychieæ,	7	7	2	1
Crassulaceæ,	16	16	10	7
Carried over				

	Brit.	Eng.	Scot.	Ber.
Grossulariææ,	6	6	5	3
Saxifragææ,	28	17	20	4
Umbelliferææ,	65	62	46	26
Caprifoliaceææ,	11	11	10	7
Loranthææ,	1	1	1	0
Rubiaceææ,	21	18	17	10
Valerianææ,	8	7	5	3
Dipsacææ,	6	6	6	5
Compositææ,	132	120	105	65
Lobeliaceææ,	2	2	1	0
Campanulaceææ,	13	12	9	2
Vaccinæææ,	4	4	4	3
Ericinæææ,	20	12	14	8
Monotropeææ,	1	1	1	0
Jasminæææ,	3	3	3	2
Apocynæææ,	2	2	2	1
Gentianæææ,	15	14	7	5
Polemoniaceææ,	1	1	1	0
Convolvulaceææ,	5	5	5	2
Boraginæææ,	24	23	22	14
Solanæææ,	12	12	9	5
Antirrhinæææ,	14	14	10	4
Orobanchæææ,	8	7	3	1
Rhinanthaceææ,	13	13	10	8
Veroniceæææ,	19	15	16	12
Labiataææ,	55	54	41	28
Verbenaceæææ,	1	1	1	0
Lentibulariæææ,	6	4	5	2
Primulaceæææ,	19	18	16	10
Plumbaginæææ,	5	5	4	3
Plantaginæææ,	5	5	5	5
Amaranthaceæææ,	1	1	0	0
Chenopodeæææ,	25	25	19	10
Polygonæææ,	23	21	23	12
Thymeleæææ,	2	2	1	1
Santalaceæææ,	1	1	0	0
Elæagneæææ,	1	1	0	0
Aristolochiææææ,	2	2	1	0
Euphorbiaceæææ,	17	17	7	5
Urticææææ,	5	5	4	4
Amentaceææææ,	84	61	70	31
Myricææææ,	1	1	1	1
Coniferææææ,	4	3	4	3
	1158	1048	879	526

II. MONOCOTYLEDONES.					Brit.	Eng.	Scot.	Ber.
Hydrocharideæ,	.	.	.	.	2	2	1	0
Alismaceæ,	.	.	.	.	9	9	6	4
Potameæ,	.	.	.	.	17	17	15	10
Orchideæ,	.	.	.	.	37	34	17	10
Irideæ,	.	.	.	.	7	6	1	1
Amaryllideæ,	.	.	.	.	5	5	2	2
Asparagæ,	.	.	.	.	8	7	6	1
Liliaceæ,	.	.	.	.	19	19	11	8
Colchicaceæ,	.	.	.	.	2	2	2	0
Junceæ,	.	.	.	.	28	22	27	14
Restiaceæ,	.	.	.	.	1	0	1	0
Aroideæ,	.	.	.	.	2	2	2	1
Typhaceæ,	.	.	.	.	6	6	5	3
Cyperaceæ,	.	.	.	.	92	77	80	41
Gramineæ,	.	.	.	.	120	110	96	58
Lemnaceæ,	.	.	.	.	4	4	4	2
					359	322	276	155
III. ACOTYLEDONES.								
Characeæ,	.	.	.	.	7	7	5	3
Equisetaceæ,	.	.	.	.	8	7	8	6
Filices,	.	.	.	.	41	39	34	19
Lycopodineæ,	.	.	.	.	6	6	6	4
					62	59	53	32

DICOTYLEDONES,	.	.	.	1158	1048	879	526
MONOCOTYLEDONES,	.	.	.	359	322	276	155
ACOTYLEDONES,	.	.	.	62	59	53	32
				1579	1429	1208	713

Of the British plants, Professor HENSLow considers 17 genera and 45 species of Dicotyledones, and 3 genera and 6 species of the

Monocotyledones, as having been naturalized *. Several of those which are native to England have emigrated into Scotland, where they are now more or less naturalized ; but, with the exception of the Scotch fir, it would seem that the English Flora has received no accessions from her northern sister. Of those which Professor HENSLow marks as aliens, the Flora of Berwick possesses 10 species ; and no less than 56 of the English aborigines have no better claim to denization in our district. Some of these have been introduced originally for their beauty or fitness for the garden ; some for their utility ; and some, which are worthless, have come uninvited, and taken possession of his fields in spite of the best efforts of the agriculturist to eradicate them. It is very difficult, however, to give a correct catalogue of the plants which have been thus introduced, and it may perhaps be thought that, from the following, not a few have been excluded on questionable grounds.

1. *Introduced by the Gardener.*

Anchusa sempervirens.	+ Onopordon acanthium.
+ Barbarea præcox.	+ Phalaris canariensis.
Berberis vulgaris.	Pyrethrum parthenium.
Borago officinalis—"venit olim ex Aleppo." WILD.	Reseda lutea.
Cheiranthus fruticosus.	Ribes grossularia ?
Chelidonium majus.	—— nigrum.
+ Cichorium Intybus.	—— rubrum.
Convolvulus sepium.	Salvia verbenaca ?
+ Dipsacus fullonum.	Sempervivum tectorum.
+ ——— sylvestris.	Spiræa salicifolia.
+ Galanthus nivalis.	Tulipa sylvestris.
+ Hypericum androsæum.	+ Verbascum nigrum.
Ligustrum vulgare.	Viburnum Lantana.
Mentha piperita.	Vinca minor.
+ Narcissus Pseudo-narcissus.	Allium schænoprasum.
+ Oenothera biennis, from America.	Sedum reflexum ?

(The species to which the mark + is prefixed are so imperfectly naturalized as to have got no permanent stations.)

* Catalogue of British Plants : Cambridge, 1829,—a little work from which I have received great assistance in drawing up the above Table.

2. *Introduced by the Agriculturist or Planter.*

Acer campestre.	Populus alba.
—— Pseudo-platanus.	—— nigra.
Brassica napus.	Prunus cerasus.
—— rapa.	Salix alba.
Carpinus betula.	—— Forsteriana.
Fagus castanea.	—— Russelliana.
—— sylvatica.	—— Smithiana.
Humulus lupulus.	Taxus baccata ?
† Linum usitatissimum.	Tilia europæa.
Medicago sativa.	—— grandifolia.
Pinus sylvestris.	

3. *Weeds.*

Agrostemma Githago.	Papaver argemone.
Avena fatua.	—— dubium.
Chrysanthemum segetum.	—— rhœas.
Centaurea cyanus.	Ranunculus arvensis.
Fumaria officinalis *.	Raphanis raphanistrum.
† Lolium arvense.	Veronica filiformis.
† —— temulentum.	

Of our wild plants, the *Statice limonium*, *Convallaria polygonatum*, *Picris echioides*, and *Sisymbrium Irio*, reach their most northern limits in N. Durham or in the liberties of Berwick; and Dunglass Den appears to be the only station in Scotland for *Viburnum lantana*. The *Ligusticum scoticum*, on the contrary, the *Symphytum tuberosum*, and the *Cornus suecica*, are scarcely to be found further south, and when they do occur it is in sparing quantities. For the *Salvia verbenaca* we have three habitats in N. Durham, but in Scotland it is said to grow only in the vicinity of Edinburgh. The *Scilla verna*, until detected by Mr BAIRD on the coast of Berwickshire, was presumed to be a peculiar ornament of the western coasts; *Rhodiola rosea* has not previously been found, in

* *F. officinalis*,—"in arvis agris vineis oleraceis orbis ferè totius, verosimiliter ex Oriente aut Græciâ orta, in Europâ ævo Gessneri rarissima nunc vulgatissima, in Americâ boreali et meridionali, et ad Caput Bonæ Spei forsân cum cerealibus aut oleribus introducta."—DECANDOLLE, *Syst. Veg.* ii. 135.

such a southern latitude, to descend even to a level with the shore; while to decorate with her warm and showy blossoms the sandy links of our coast, the *Geranium sanguineum* has left her "alpine or limestone pastures." The *Tragopogon major*, as a native plant, was first discovered in Berwickshire, nor is it yet known to grow in any other part of the kingdom. *Trifolium leucanthum*, *Senecio tenuifolius*, *Euphorbia esula*, *Veronica filiformis*, *Aspidium aculeatum*, and its variety *angulare*, are all late additions to the British or Scotch Floras, and among the most interesting for their rarity.

There are some plants of frequent occurrence with us which are esteemed rare in Scotland. *Cnidium silaus*, so common in Berwickshire, would appear to be confined to the Border, for it has only been detected besides in the adjacent county of Roxburgh. *Cerastium arvense* is found near Edinburgh sparingly, and not elsewhere in Scotland, except on the banks of the Tweed, where, from its mouth upwards to Kelso, it is a rather common flower. *Scabiosa columbaria*, *Primula elatior* and *veris*, *Viola hirta*, *Hordeum murinum*, *Lactuca virosa*, and *Carex curta*, all accounted rare in the *Flora Scotica*, are some of them far from uncommon, and the three latter are abundant with us. On the other hand, the following, which are said to be frequently met with in the north of England, and in the south or lowlands of Scotland, must be esteemed amongst our rarest plants, viz. *Galium boreale*, *Symphytum tuberosum* and *officinale*, *Adoxa moschatellina*, *Bidens cernua*, *Cnicus heterophyllus*, *Myrica Gale*, *Asplenium ruta-muraria*, and *Cystea fragilis*; and we do not possess at all *Poa aquatica* and *nemoralis*, *Stellaria nemorum*, *Myosotis sylvatica*, *Aspidium thelypteris*, nor even the vulgar weed *Anthemis cotula*, though all of them are accounted at least not uncommon in districts similar to ours in soil and climate.

In regard to the distribution of our phænogamous plants, I have but a few remarks to make. On traversing our shores to the south of the Tweed, it is obvious enough that, on the links, or where the shallow soil lies immediately above limestone, the herbage is short, even, and close, unless the sand is so loose as to permit the growth of few other grasses than of the bent. This herbage is profusely enamelled with many pretty flowers, such as the *Erodium*, the *Pimpernel*, the *Cerastium arvense*, the purple *Astragalus*, *Galium verum*, *Erythræa littoralis*, *Ononis*, and the

Gentians, &c. ; and amongst the bent, the *Geranium sanguineum*, the *Cynoglossum*, *Echium*, the *Burnet Rose*, &c. show off bravely. But where the continuity of the siliceous links is broken in upon by a sandstone cliff, the change in the vegetation is immediate, proceeding, probably, not so much from the change in the nature of the subjacent strata, as from concomitant alterations in the depth and moisture of the soil. The grass becomes coarse and rank, the bent and the flowers above enumerated disappear, and their place is supplied by tall grasses,—the primrose, cowslip, the early orchis, wood sage, hypericums, and the various heaths, &c. The point of Hudshead, which is a sandstone cliff, affords a fine illustration of these remarks, when contrasted with the links on either side of it, which have limestone as a base, for the only plants common to the two sites are the *Gentiana amarella* and *Geranium sanguineum*,—the former apparently not at home on the sandstone, but the latter is as luxuriant and ornamental on either place as it is on the greenstone cliffs of Arthur's Seat.

The coast of Berwickshire is very different from that of N. Durham in its physical characters and in its vegetable productions. It is rocky and precipitous, fissured, however, by frequent and deep ravines, through each of which a burn or streamlet finds a way to the sea, where, at its debouchement, it forms a sandy plat generally of small extent. The only exception to this general character occurs at Coldingham, where the shore is low and sandy, similar to that of Durham. The rocks for the three or four first miles from Berwick northwards are sandstone, covered in general by a deep soil and a coarse vegetation ; and there are many wet spots favourable to the growth of the large *Umbelliferae*, the *Eupatorium*, *Equiseta*, and the tall *Festuca*. The *Geranium sanguineum* abhors the fellowship of these vulgar species, and is no where to be seen north of the river, but its place is supplied by the red lychnis, which flourishes here in great profusion, and by the *Geranium pratense*, less choice in her companions. Even where the coast is driest, the flowers which are so profuse on the opposite shore are not to be found ; the purple astragalus, the pimpernel, the gaudy viper's-bugloss, &c. have disappeared entirely, and the scurvy grass, the primrose, the dog's violet, the orchis, the white saxifrage, &c. occupy the ground. Some spots there are on these banks, which, in summer's pride, display much floral beauty, and for its pre-eminence in this respect the Needle-

eye deserves a passing notice. In June and July that picturesque promontory glows with one full flush of vegetation, where the red lychnis, the fair white blossoms of the sea-campion, spotted with their purple anthers, and recumbent on the soft sea-green under foliage, and the sea-pink, with her rose-coloured buttons, and other blossoms, white, blue, and red, commingle to produce one of the most brilliant and charming scenes.

“ Lo ! how they springe and sprede, and of divers hue,
Beholdith and seith, both white, red, and blue.
That lusty bin and comfortabyll for mannys sight,
For I say for myself it maketh my hert to light.”

The sandstone strata are succeeded by rocks of grey-wacke *, and the change in the vegetable covering, if not striking at a first glance, is nevertheless considerable. Unless the spot be moist and boggy, and now there are few such spots, the grass grows no longer rank, but forms a short green sward, principally, perhaps, the growth of *Festuca*. The lychnis and the umbelliferæ leave these banks, retiring to the moist recesses in the ravines; the astragalus reappears, without, however, its companions, on the southern shore, for the arenose plants do not endure even this soil; but we now meet with the ox-lip, the dwarf cistus, the vernal squill, rose-root, the Scotch lovage, and others of a less interesting character. On the unstratified rocks we find also the *Arenaria verna* and *Dianthus deltoides*, which, in Berwickshire, appear to be confined to this formation. The sandy plats produce the same species as occur in similar sites in N. Durham, with only the exceptions of the *Erythræa littoralis* and *Geranium sanguineum*, a deficiency almost compensated by the presence of the yellow horned-poppy.

Such is a very general outline of the botanical peculiarities of our coast, and relative to those of the interior I have little to say. Almost all the plants mentioned in the Flora are found scattered through the district, from the shore even to the most inland parts, distributed in general without any regard to the nature of the geological formations, except in so far as the rocks may affect the superincumbent soil in respect of depth, chemical composition, and moisture. We have here, of course, as every where else, plants which are peculiar to the sea side, to meadows, to culti-

* See preface to vol. i. p. 18, &c.

vated grounds, to wastes, to rocky arid ridges, to deans, marshes, pools, rivers, moors, and mountains, but there is very little of peculiarity to call for remark. The *Senebiera coronopus* is confined to the vicinity of Berwick; the *Convolvulus arvensis*, *Sedum anglicum*, *Thalictrum minus*, *Carlina vulgaris*, and *Scirpus caricinus*, are not to be found except near the sea, nor does the *Erodium* appear to extend much inland. On the contrary, the *Galeopsis versicolor*, of extremely rare occurrence in the east, becomes a weed in the west of the county; and the *Cerastium vulgatum* and *Dianthus deltoides* flee our vicinity to flourish in abundance in the west, east, and northern parts. The heaths are observed always to avoid limestone; *Arenaria verna*, *Potentilla verna*, *Viola lutea*, *Teesdalia nudicaulis*, *Vicia lathyroides*, *Trifolium scabrum* and *striatum* are confined to unstratified or trap-rocks, the favourite soil also for the dwarf *Cistus*, the *Hypericum humifusum* and *pulchrum*, although by no means the exclusive one. The *Digitalis* is most abundant in the greywacke districts, and, so far as I know, there is with us only one station for it in the lower and sandstone formation; while this is preferred by the *Lactuca virosa* which, on the banks of the Tweed, attains a gigantic size, being at least double of that which it is said to attain in other districts.

To suggest some slight aids to rural industry may not be deemed beyond the province of the botanist, however much it is beyond his power to put his suggestions into practice. A few women and children might be agreeably and perhaps profitably employed for some days in summer in gathering and drying medicinal herbs, of which some valuable kinds grow abundantly in our district. Hemlock, foxglove, henbane, deadly-nightshade, the tops of broom,* and the berries of juniper, are of this description. To secure a sale and a fair return for them, it will be necessary that the utmost care should be taken in gathering the respective

* The broom was once more common in the immediate vicinity than it is now. Its destruction commenced early, as is proved by the following extract from a MS. in the British Museum, for which I am indebted to the attention of Mr Weddell. In 1554, before the Bailif's Court, a jury of twelve men found "that the yonge brome of this towne ought not to be cut, for it is a comodyte to this towne:"—how, we are left to guess; it might be used for strewing floors, or making besoms, —called *brooms* in the north,—if the practice of sweeping floors had been introduced at that time.

plants at the proper season, and preserving them in the best manner, but the rules are few and simple, and might be procured from any respectable medical practitioner. As it is now ascertained, on unquestionable authority, that the *Chondrus crispus* is sold, by the most respectable apothecaries, in lieu of the Iceland moss, and in many cases may be the preferable article, so there is nothing to prevent our druggists procuring a sufficient supply from their own shores. There are some herbs used to a greater extent amongst our peasantry and labourers, than those who have not mixed with them, and inquired into their habits, will readily believe; and to some of these simples they ascribe an efficacy in certain diseases equalled only by the specifics of the newspapers. But to prescribe these remedies in proper cases is not beneath the dignity of the physician, and he may thereby lessen the expenditure of the poor. A poultice of the leaves of the mallow or *maas* is cheaper than one of bread and milk, and equally efficacious. An infusion of the clary or of chervil is a very bland fomentation, and will be used sedulously by the patient when the prescription of warm water alone would be regarded as almost trifling with his complaint. The buckbean, the chamomile, and the mugwort, are bitters in common use amongst them, and are in some cases little less powerful than gentian or quassia, and perhaps more so when prejudice aids the operation of the former. The roots of burdock and dandelion will always supply excellent substitutes for the very expensive sarsaparilla; and the roots of *Carex arenaria* and *hirta* have been said to possess similar properties. There are not better tonic astringents in the *Materia Medica* than what the common avens and tormentil afford, and the latter in particular might be gathered in any quantity on our moors. Perhaps our fishermen might procure from its roots a good tan for their nets.

If the water-cress were regularly brought to our market, there would soon, in all likelihood, arise a demand for it, for it is a very wholesome salad, too bitter perhaps to be eaten by itself, but which would mix well with other herbs of similar properties. And were our fisherwomen instructed in the mode of preparing laver, I do not doubt that we might also in time acquire a relish for this hitherto expensive delicacy, the more particularly as there is a general, and, I think, a well-grounded belief in its usefulness in scrofulous constitutions.

No. VII.

A SKETCH OF THE BOTANY OF NORTH DURHAM
AND BERWICKSHIRE, FROM THE EARLIEST
PERIOD TO THE PRESENT TIME.

THE earliest accounts of North Britain represent it as everywhere covered with marshes and with extensive forests, in which the inhabitants fed their numerous herds, and cultivated some corn in the clear intervals. When applied, however, to any particular district, this general description is found too vague to be satisfactory; and as history does not afford the necessary details to fill up the outline, we must seek them in the relics of former centuries, or in the less certain investigations of the antiquary and philologist.

North Durham and the eastern parts of Berwickshire lie greatly exposed to cold winds from the north and east, which prevail much, and are so prejudicial to the growth of trees, that the district is nearly destitute of them. In the deep ravines which break the rugged outline of the coast of Berwickshire, there is indeed very often more or less brush-wood, and sometimes a group of trees of considerable size, but these never rise above the shelter afforded by the precipitous banks. The district, in this respect, has been probably much the same in all ages, for its physical features have remained immutable, and of the elements "that which hath been is now." This conclusion is rendered almost certain by other considerations. In the name of Berwick we may perhaps trace an evidence of the barrenness of its vicinity; and it is conjectured that the Merse has received its name from the pristine nakedness of the lower parts of the county. "In the parishes of Hutton, Whitsome, Ladykirk, Swinton, Coldstream, and Eccles, we do not trace, on the maps, any name of a place which derived its designation from a wood," says the laborious author of *Caledonia*.

On the contrary, the north-east and western parts of Berwickshire were extensively wooded. The names of villages in which

we read the existence and sites of woods are numerous; and in the regal grants and chartularies which have been preserved, there is frequent mention of them. MALCOLM IV. of Scotland, who began his reign in 1153, granted to the Prior of Coldingham all the woods (*bosca*) within the bounds of that famed monastery*; and in a subsequent and similar grant of WILLIAM, the immediate successor of MALCOLM, we have these woods (*nemora*) distinctly specified, and the limits of the monastery accurately defined. The woods were Grenewde, Ristuna, Broccheholewde, Akesside, Kirchedeneswde, Harewde, Denewde, Swinewde, and Hundewde, —all of which were situated within a line extending from the division between Berwick and Lamberton to Billie, thence to Drieforde, thence by Mereburn to Crachoctre, thence to Eiforde, and thence to the rivulet which flows into the sea by Aldchambpethe. It may now be difficult to trace this line very exactly, but it seems to have bounded the district occupied by the modern parishes of Mordington, Foulden, Chirnside, Ayton, Coldingham, and Coldbrandspath,—a district which is indebted to the planter for almost all the wood it now possesses, although, in the two latter parishes, there are considerable remnants of its ancient groves. It forms the north and east division of Berwickshire; and it seems unnecessary to specify what the woods of the west were, as, in fact, that part appears to have been nearly one continuous forest, except only where interrupted by morasses, or cleared away by man in the vicinity of his dwellings. Even the Lammermuirs, now rich only in “*morishe evill ground of little valore*,” was in those early, or rather in earlier periods, wooded with trees of great size, as we are assured from the circumstance of the trunks of them having been dug up out of mosses in that range of the most bleak and profitless aspect.

The application of this wood to buildings and to fuel, its destruction in war, the extension of agriculture, and natural decay, were the causes of the gradual diminution of these forests, which, in the 16th century, had almost disappeared. At that time, and for two hundred subsequent years, North Durham and Berwickshire had a most uninviting appearance. The landscape was naked, and deformed with marshes, which had increased greatly in extent, and in autumn breathed forth an annual pes-

* See RAINE'S *Durham*, App. p. 7, No. xxx.

tilence,—the fields were unenclosed,—the soil was sparingly and ill cultivated,—the castles of the great were rugged piles, and mostly in decay or ruin,—while the dwellings of the peasantry were wretched hovels constructed of mud. This is no imaginary picture. LELAND, whose survey of these parts was made between the years 1534 and 1540, says, that betwixt Alnwick and Berwick there was “little plenty of wood;” in Bamboroughshire “little or no wood;” and from “Riddenborn alonge Tweed to Barwicke almost no wood.” In their account of the Borders in 1542, Sir ROBERT BOWES and Sir RAUFE ELLEKER inform us, that “there ys no store of timbre wood in those parties*.” Something indeed of the ancient forest of Cheviot remained, but it was “spoyled,” and consisted solely of “crokyd old trees and schrubbs†:” and that the remains of the woods in Berwickshire were now of a similar character, we have the testimony of Bishop LESLIE. In his description of this part of Scotland, he says, “Habent hi raras sylvas, raraque alia ignis fomenta, quibus cæteræ omnes nostræ provinciæ abundant. Unde fit, ut stipulis, maxime Marchiani, lignorum loco utuntur.”—*De Orig. Scot.* p. 7.

* See also RAINE'S *Durham*, p. 16.

† The interest of the following description of the once “great wood of Cheviot,” is the best apology for the length of this note. “The forrest of Chevyotte ys a mounteyne or greatt hyll, foure myles or more of lengthe, lyinge betwene the head of Ellerburne and the whyte swyre towarde the easte, and the hangynestone towarde the west. And towarde the northe yt devydethe England and Scotland by the heighte of yt as the water descendeth and falleth. And the Englishe p'te thereof exceedeth not three myles of breadeth. And the most p'te thereof, and esp'ially towarde the heighte, ys a wete flowe mosse, so depe that scarcely eyther horse or cattall may goe thereupon, excepte yt be by the syde of certayne lytle broukes and waters that springeth forthe of the said mountaine, by reason whereof the said forrest ys not inhabytable, nor serveth very lytle for the pasture of any cattalle excepte onely wylde bestes, as redde dere and roes.

“Out of he southest p'te of the said mountayne springeth and descendeth a lytle ryv' called Colledge. And oute from the southe syde thereof an other lytle brooke or water called Caldegate; and upon the sydes, as well of the said two lytle riv's as nere to other lytle brookes, sprynginge out of the said mountayne and dyscending into the said twoo lytle ryv's, there growyth many allers and other ramell wood, whiche servethe muche for the buildinge of suche small houses as be used and inhabyted by husbandmen in those p'ties.

“The Scottes, as well by nighte tyme secretly as upon the daie tyme with a more force do come into the said forrest of Chevyott dyv'se tymes and steale and carrye awaye muche of the said wood, which is to them a greatt proffyte, for the maynte'unce of their houses and buildinges.”—From HODGSON'S *History of Northumberland*.

We may now take an equally rapid survey of the progress of Agriculture in the district. At the time of the Roman invasion, the soil of Britain, we are told, yielded "corn in great plenty,"—an observation applicable undoubtedly only to the southern parts of the island. The Anglo-Saxons, in the fifth century, found our district very little cultivated; and for the five or six centuries following, agriculture made no progress. About the twelfth century, however, according to CHALMERS, it became "the universal object of pursuit from the prince to the peasant;" the grains being oats, wheat, barley, pease, and beans. Oats were most sown; wheat was much cultivated throughout the south and east of Scotland; less barley was raised, and pease and beans* in still smaller quantities, while rye seems to have been scarcely attended to. An estimate of the relative proportions of the corns grown may be formed from the tithes paid in those times. Thus, in 1326, "the tithes (corn) of Fenham, Fenwick, and Beale, are collected in the chapel at Fenham, and, by valuation, consist of 90 quarters of wheat at 4s.—L. 18; 80 quarters of barley at 3s.—L. 12; 120 quarters of oats at 2s.—L. 12." And thus, in 1339, at Fenham, 48 acres were sown with wheat, 19 with barley, and 50 with pease and oats†. Lint, though not mentioned in these entries, was certainly, says CHALMERS, in cultivation as early as the twelfth century; but the artificial grasses were unknown. "The vast woodlands which every where skirted the arable grounds, gave a shelter to the crops that greatly promoted their growth, and amply augmented their produce. The woodlands were still more important, for the warmth which they afforded to a bleak country, and for the pasturage that they supplied numerous herds. Thus, the universal woods enabled the husbandmen to raise larger quantities of corn, and to rear greater numbers of swine, cattle, and horses, than modern prejudice will easily believe."—CHALMERS.

Immediately after this time the agriculture of the district ap-

* "At the siege of the castle of Dirleton in East Lothian, about the beginning of July 1298, the English soldiers were reduced to great scarcity of provisions; they subsisted on the *pease and beans* which they picked up in the fields. This circumstance presents us with a favourable view of the state of agriculture in East Lothian as far back as the 13th century."—Lord HAILES' *Annals*. This extract I owe to the attention of Mr WEDDELL, to whom I am also indebted for much other curious information relative to the subjects of this essay.

† RAINE'S *Durham*, pp. 32 and 34.

pears to have rapidly retrograded. The shelter of the woods, which each passing year tended to lessen, enabled our ancestors to raise corn in places and at an elevation where it cannot attain maturity without that shelter; nor could their successors wholly counterbalance this loss by ploughing out the lower grounds, for as the forests died away, the marshes enlarged their bounds, and the practice of draining was unknown. Nor, independent of natural causes, could the state of agriculture be otherwise than bad in a district subject to continual inroads and devastations, and the inhabitants of which were themselves fond of predatory warfare. From the interesting survey of Sir R. BOWES and Sir R. ELLERKER in 1542, it appears, however, that the Scotch border was, upon the whole, better cultivated than the immediately adjacent parts of England; for they tell us that the Scotch were in the custom of driving their cattle out of their own lands, "to be continually and daily pastured and fedde wythin the grounde of England," and for this good reason, "they have plowed and sown all the grounde within their towneshipes that will bear any corne, and pastures and fedes all theyr cattall and shepe in greatt numbers wythin their grounde of England, to their greatt profytte and advantage." But more than a century after this, the condition of Berwickshire was wretched when compared with the peaceful counties of the south at the same period. For the correctness of this statement, we have no less authority than that of the celebrated JOHN RAY, who visited Berwick in August 1661. No sooner has he entered Scotland than we find him remarking that the Scots "have neither good bread, cheese, or drink. They cannot make them, nor will they learn. Their butter is very indifferent, and one would wonder how they could contrive to make it so bad. They use much pottage made of coal-wort, which they call keal, and sometimes broth of decorticated barley. The ordinary country houses are pitiful cots, built of stone and covered with turves, having in them but one room, many of them no chimneys, the windows very small holes, and not glazed. In the most stately and fashionable houses in great towns, instead of ceiling they cover the chambers with fir boards, nailed on the roof within side."—"The ground in the valleys and plains bears good corn, but especially bear-barley or bigge, and oats, but rarely wheat and rye. We observed little or no fallow ground in Scotland; some layed ground we saw, which they manured with

sea-wreck. The people seem to be very lazy, at least the men, and may be frequently observed to plow in their cloaks*.”

It was not until towards the middle of the last century that the agriculturist roused himself from this apathy, and commenced those works which have rendered a noisome soil fruitful beyond hope†. Plantations were made to supply the place of the natural woods which had disappeared, the morasses were drained of their superfluous moisture, and corn grew up instead of the sedge and reed. Wheat is now the staple grain; oats and barley are raised in large and nearly equal quantities; rye is neglected, except in some parts of N. Durham and about Wooller; pease, beans, and tares, are grown in due proportions; the artificial grasses have been introduced with eminent success; and nowhere are the turnip and potato more advantageously grown. Lint is cultivated in small quantities for the use of the cottar‡. There is, in fact, no part of the United Kingdom where the art of farming is at present better understood and practised than in Berwickshire and N. Durham, and few where it is so well; and from whatever commanding height the spectator may choose to look, the Merse opens before him a rich and exhilarating prospect,—an extensive plain, well wooded in every part, everywhere intersected by living hedges, and bearing on its varied and fruitful bosom all sorts of grain and herbage for man and beast. The contrast between its former and present conditions is curious and pleasing. We may carry the prospect back to what it was ere man had become possessor of the soil, when a forest of native trees covered the surface, and extended even over those heights which now eschew all plants except heath and the coarsest grasses.

* *Select Remains*, p. 188-9.

† SWINTON of Swinton was the first to give an example of improvements in our agriculture, about 1730. The turnip husbandry, and the cultivation of potatoes, were introduced by Lord KAMES in 1746.

‡ The cabbage and carrot are very seldom grown in fields in Berwickshire. The mangel-wurzel has been partially tried without success. Buckwheat is grown only in preserves for pheasants. Lucern is not cultivated except in the immediate vicinity of Berwick, where I have seen two small patches by no means in a thriving condition. During the American war, and previous to the application to Scotland of the prohibitory law by the act of 1782, tobacco was cultivated on the banks of the Tweed and Tiviot with the most promising results. This act overtook the planters in the midst of their labours, and compelled them to root up their plantations, and dispose of the produce to government at a third part of its market price.—*Quart. Journ. of Agriculture*, No. vi. p. 771.

Of this forest the red deer was probably the principal occupant ; and in this extensive covert he ranged, in company with roes, wild oxen, and swine, free of all annoyance, except, we suppose, what is not unlikely, that the wolf was their contemporary and cohabitant, for of the other savage animals which were their mates, none were large enough to make them their prey. Amid the woods there were extensive lakes, frequented doubtless by numerous flocks of water-fowl ; and on the banks of which the beaver constructed his singular dwellings *. Passing over some centuries we find these lakes converted into morasses,—the wood in many places has decayed, and left a soil fitted for grain,—the deer and the savage beast have retired to the higher grounds,—and man, in a rude though not a savage state, presents himself, subsisting much by the chase, yet not ignorant of the cultivation of corn which he has brought along with him. Other centuries have passed away, and with them all traces of the Roman invasion, when the woods of Berwickshire have become scattered and limited in their extent, haunted no longer by game and beasts of prey, but where the *villain* pastures his cattle, and his more numerous flocks of swine. The soil appears cultivated to a considerable extent, and from its freshness is abundantly productive: The strong towers of the chieftains, pitched on the edge of precipices and deep ravines, or on an elevation in the midst of marshes, form prominent objects in the landscape, yet less striking than the splendid abbeys occupying sites chosen rather for their fertility and beauty than for their aptness of defence. At this period it is probable that most of our fruit-trees and esculent vegetables were introduced, and many of our flowers, now run wild, although even yet scarcely to be found far from the ruins of monasteries and castles. A few more centuries saw the decay and destruction of these stately buildings; and the *villains*, freed from their vassalage, left the precincts of places where they no longer found a fostering shelter, and scattered their little villages of unhewn stone or mud-built cots over the country. Cultivation became generally diffused, but it was slovenly done, and the return was scanty ; the land was naked of trees, without hedges and without roads, marshy in the extreme, and unwholesome ; and in this condition it lay until peace and law assured the security of

* NEILL in *Edin. Phil. Journ.* i. 184.

property, and gave birth to that enterprise which has made the county "a vast garden created by human industry."

The ancient forests are said to have been formed chiefly of oak, which attained a large size; but perhaps its abundance has been overrated, for it seems to have been always guarded with care, and when grants of it were made to abbots and barons, the number of trees are regularly specified,—a caution scarcely requisite had the article been common or superfluous*. The birch, alder, and hazel† were probably the predominant species. The roan-tree, the elm, the hawthorn, the bird-cherry, the holly, the Guelder-rose, and three or four willows‡, contributed to thicken and vary the forest. All these are still to be found truly wild in our most retired deans, or by the sides of rivulets, although in trivial quantities, and of degenerate size. The Scotch fir, no longer indigenous, formed a considerable part of the pristine woods, for great abundance of its trunks have been "dug up in mossy and moory bogs where they cut for turf," in many parts of the north and east of England§; and I have been told that its cones have been found in peat-mosses on the Lammermuirs. Historians assert that the ash and beech were, in these earliest times, likewise of native growth,—an assertion which some naturalists have questioned. No traces of them, it is said, occur in our mosses; yet ash-keys and beech-mast would in all probability have proved as indestructible as hazel-nuts or fir-cones, which are abundant. But the absence of this proof is not so conclusive as might at first appear, for the trees grow by preference in such situations as would make it difficult for their fruit to drop in places fitted for their preservation by the astringent qualities of the soil or water. Of the beech, however, there is no proof of

* In 1347, one item of the expenditure of Holy Island Priory is, "To the Abbot of Newminster, for four oak trees bought of him, 46s. 8d."—a large sum in those days.

† "The part of Britain long since called Scotland, was known to the Romans by the name of *Caledonia*, because, says Sir WILLIAM TEMPLE, the north-east part of Scotland was by the natives called *Cal Dun*, which signifies hills of hazel, with which it was covered."—MURPHY'S *Tacitus*—Notes on the Life of Agricola.

‡ *Salix alba, caprea, cinerea, aquatica, aurita et pentandra.*

§ See EVELYN'S *Silva*, p. 265, *et seq.*, and the Notes by Dr HUNTER, at p. 281.

its having at any time been indigenous to our district*; but it is different with the ash, which, in my opinion, still occurs truly wild in some of our deans†. Dr WALKER‡, the best of all authorities in a question of this kind, enumerates it amongst our native trees; and in the names of villages, conferred certainly previous to the existence of plantations, we find good evidence of the fact. Thus, in the adjoining county of Roxburgh, we have Ash-trees, Ashie-bank, and Ashie-burn; and in Selkirk, Ash-kirk, —names obviously bestowed from the circumstance of the ash having grown there more abundantly or luxuriantly than elsewhere. The yew, a true native both of England and of Scotland, can only claim a doubtful place among the original trees of Berwickshire§; for the few that now occur are always near the old residences of the gentry. From the vulgar superstitions which have long been associated with the aspen, it may be presumed to be indigenous; and the *Populus canescens* occurs in a patch of natural wood in the neighbourhood of Longformacus. Of the black and white poplars, I can offer no evidence for their being enumerated amongst our wild trees. The crab-apple and the elder are common in our district, the former in every hedge, and the latter near villages, hamlets, and monastic ruins; yet it would be difficult to point out a single site where they are certainly wild. If introduced, as is not improbable, they are now, however, perfectly naturalized, and owe their preservation in their present habitats, the one to its beauty and use, the other to the regard paid it on account of its reputed medicinal and

* Dr WALKER says, “the beech was not copiously planted in Scotland, till a little before and after the Revolution; but a few, he conjectures, were planted as a curious foreign tree, not later than between 1540 and 1560.”

† Item of expenditure for Holy Island Priory in 1335-6: “Thirteen ashes for ploughs and carts, 19s. 6d.” These ashes must surely have been of native growth. In Dr MACCULLOCH’s *Highlands and Western Islands*, the ash is mentioned as growing in very many places where it must be indigenous. See also MACGILLIVRAY in the *Edin. New Phil. Journ.* for July 1830, p. 189.

‡ *Essays on Natural History*, by JOHN WALKER, D. D. Edin. 1808, 8vo.—an excellent work, much neglected by those who have subsequently written on the Flora of Scotland.

§ “I have been informed by persons well acquainted with our marshes, that the yew makes a part of the *fossil wood* of the north of England.”—GOUGH in *Manchester Mem.* iv. p. 10.

anti-magical virtues*. I cannot but think that the gooseberry has a good claim to be reckoned a native of the south of Scotland. There seems no climate so well suited to its disposition, for it thrives neither in colder nor in warmer latitudes; it is still to be seen in—as I think—a wild state in our deans, as in the ravine south of Fast-Castle, in the wood below the Pease-Bridge, and about the Retreat; and when planted out in woods, it endures long, and withers not away as if it were an alien. None of the currants, however, are met with unreclaimed in Berwickshire, although both the red and black may occasionally be seen lingering near the almost obliterated ruins of mills in remote deans.

Of the trees which are certainly aliens, and with which the modern plantations are in a great measure formed, the “heavy-headed plane” (*Acer pseudo-platanus*) is one of earliest naturalization. The time of its introduction is uncertain, some time certainly before the Reformation; but it is now common, and attains a great size. There are some very fine trees of it at Foulden, and in various other parts of the county; but the largest, if perchance they still exist, are those mentioned by Dr WALKER at Nisbet; one on the south side of the walk in the shrubbery, leading to the garden, which, in September 1795, was about 60 feet

* There are some large bushes of elder on Holy Island, where, I think, no other tree grows. The sloe and the burnet rose occur in a much dwarfed state, and perhaps there is little more than a bush of each. The black poplar and a willow have been planted at the Lough, and annually put forth leaves in their struggle for existence. An anonymous writer asserts, “that there are no parts of the coast of Great Britain better adapted for the growth of the fir-tree than the northern shores of Holy Island; and where, at the same time, their plantation would be attended with more benefit, and, finally, with more profit to the proprietor: the quantity of land which, by a little industry, might be gained is very great, and many advantages to the climate, vegetation, and soil, would flow from a change in the geographical relations of the island. We hope that our having mentioned the practicability will call the attention of others to the execution:”—*Edin. Journ. of Nat. and Geograph. Science*, ii. 43,—and realize the fanciful creations of Miss PORTER! In her pages such speculations may not be out of place,—they seem to us unsuitable to those of a Journalist whose pretensions to science are something of the highest.

For the following curious extract relative to the Farn Islands, I am indebted to Mr WEDDELL. “*Insula Farne—quæ hinc altissimo, inde infinito clauditur oceano, tunc aquæ prorsus inops, frumentis quoque et arboris, malignorum etiam spirituum frequentia humanæ habitatione minus accommoda. Verum, illo quoque virum † Dei comitante Miraculorum gloria, de rupe saxosa precibus fontem elicuit. de tellure durissima segetem produxit, hoste antiquo cum satellitum turba fugato, locum ipsum habitabilem fecit.*”—*Symeon of Durham*, p. 39 and 40.

† The pious monk speaks of St CUTHBERT, who entered the monastery of Lindisfarne A. D. 676.—(*Weddell*.)

high, and measured in circumference 8 feet 6 inches; the other on the lawn behind the house, was between 60 and 70 feet high, and measured 12 feet 3 inches. Two species of lime* are to be found in the "walkes and places of pleasure of noble men," and more rarely in plantations, which, to judge from their size and appearance, must have seen a century at least sweep over them. The lime is rare in the eastern division of the county, but common in the west. The chestnut and horse-chestnut—recommended by its "most glorious flower,"—the hornbeam, the gean, the smooth-leaved elm, the Scotch fir, the larch, the silver, Weymouth, and spruce firs, the Balsam poplar, the Bedford willow †, and a few others of rare occurrence, are all of comparatively recent introduction. The walnut, introduced into Scotland about 1684, is seldom seen in Berwickshire; while the laburnum, with its golden chain, is a common ornament of our hedges. It was first planted in the end of the 17th century, and Dr WALKER mentions a tree of it which was cut at Greenlaw in the year 1763, and measured in circumference 4 feet 6 inches.

That the changes in the extent and state of our woods and agriculture which I have endeavoured thus to trace, have been accompanied with considerable changes in the distribution and comparative frequency of our wild herbaceous plants, will admit of no reasonable doubts. When the lakes were filled up, the aquatic plants must of necessity have disappeared; and the result of the draining of marshes must have been similar on the plants peculiar to them. Many a flower, nursed up in their shelter, assuredly died away when the woods had fallen; and golden harvests have displaced from the meadows the spontaneous and barren covering of nature. To compensate this loss, which I would not wish to overrate, a greater number of plants have perhaps been naturalized. The introduction of some of these was probably coeval with the first peopling of the island, or at least as early as the knowledge of agriculture; for, to use the words of SOUTHEY, "there are weeds which never show themselves in the wilder-

* *Tilia europæa* et *grandifolia* of the English Flora.

† Dr WALKER mentions a willow (*Salix amerina*), with a fine foliage and good for basket work, which "was planted copiously by the side of the Eden, below the House of Mellerstain, in Berwickshire, where it now makes a fine appearance. The largest tree in September 1795 was 30 feet high, and measured in circumference 4 feet 10 inches."

ness, where the forest overshadows, or the brake chokes them with its stronger growth; but they spring up in the garden and the cultivated field, and become rank and noxious, in consequence of the very labour which man hath bestowed in preparing and manuring the ground." To this early period I might perhaps refer the introduction of most of the weeds which have at all times annoyed the farmer; but there are among them some whose appearance has undoubtedly been of a later date. Other naturalized plants, as I have already mentioned, have escaped from the garden, where they were at first cultivated by the monks, for the purposes of surgery and medicine, or for the expulsion of the demons and aerial spirits which haunted every wood and stream, and were ever ready to become the unwelcome tenants of this "human microcosm." CHALMERS tells us, that in the age of William the Lion, gardens appear to have been not very uncommon in Scotland; and he further tells us, what is more to our purpose, that "in Bondington, near Berwick, there were gardens in those times." At Coldingham there was also a very extensive one, as we learn from a charter of Alexander the Third, printed in the appendix to Mr RAINE'S *History of Durham*, and pointed out to me by my friend Mr WEDDELL. This deed was executed in the 10th year of his reign (1259), and, amongst other valuable gifts of David de Quikeswude*, confirms to the monks of Coldingham, *ten acres of land under cultivation with flowers*, and situated within the bounds of the monastery†. Soon after this time, gardens for raising culinary herbs became common; and when it is remembered that all, or almost all, of them have been removed, and can now only be traced in the chartularies or by the eyes of antiquaries, it seems remarkable that the plants derived from this source should be so few; and even these linger about their first abodes, affording by their presence the best evidence we have

"That Art had sojourn'd there in days of yore."

* RAINE'S *Durham*, App. p. 14, No. lxxv.

† Quixwood, in the parish of Abbey, and now the property of the Orphan Hospital of Edinburgh.

Of naturalists who have made this district the scene of botanical discovery, the first of whom I find any mention is Dr WILLIAM TURNER, who was born at Morpeth in Northumberland, and died at London in 1568. He attained great eminence as a physician, naturalist, and divine; and was the author of the first Herbal written in the English language. He discovered *Artemisia gallica* on Holy Island. The *Cornus suecica* "was first revealed to the curious" by Dr THOMAS PENNY, and it was on Cheviot that he made this interesting addition to our Flora. PENNY died in 1589, leaving behind him the reputation of great learning in his profession; and for his "singular knowledge of plants," he was accounted, according to GERARDE, "a second DIOSCORIDES." GERARDE also commemorates a Mr WILLIAM BROAD, who informed the worthy herbalist that the *Parnassia palustris*, a flower of unfrequent occurrence in the southern counties, grew on our Castle-hills, and the existence of the plant there at the present day is certain evidence of the accuracy of the information. Who or what this BROAD was, is uncertain; nor does such a name occur in our medical biographies. But the name of JOHN RAY is one famous and pre-eminent in the annals of natural science. This great man visited Berwick and the most remarkable places in its vicinity in the summer of 1661, and again in the year 1671; and he has recorded the rarer plants which he observed, in his *Synopsis Stirpium Britannicarum*. They are not numerous, and two of his species have certainly disappeared, viz. the *Pulmonaria officinalis* and *Tofieldia palustris*, for the conjecture I formerly hazarded relative to the station of the latter is erroneous, as appears from the following passage in his Itinerary. "About two miles from Berwick, by the side of a rivulet, in a boggy ground, not far from the road leading to Edinburgh, we found a sort of *Pseudo-asphodelus* which I had never before seen, much less than that common in England, having, as I guess, white flowers in a spike, to which succeed roundish seed-vessels. The stalk of the spike is naked, or not having above one leaf, the spike itself short, the root fibrous, as that of the common*." Nor did the researches of the Rev. JOHN WALLIS—"a worthy English divine"—who published his elaborate work on the Natural History of Northumberland in 1760, add much to an acquaintance with the plants in

* *Select Remains*, p. 182.

North Durham, a district included in his plan, but which he appears to have had very few opportunities of examining in person. The *Astragalus glycyphyllus*, *Salvia verbenaca*, mistaken for *S. pratensis*, *Dianthus deltoides*, *Rubus chamæmorus*, *Gnaphalium dioicum*, *Marrubium vulgare*, and *Aster Tripolium*, are the only uncommon plants to which are affixed habitats situated within our limits. On his return from Scotland in 1772, the Rev. JOHN LIGHTFOOT, the celebrated author of the *Flora Scotica*, passed through the eastern parts of Berwickshire, but of what he observed there, *Viola lutea* was the only one rare enough to be deemed worthy of notice. The Berwickshire habitats given in his admirable work are few, and were furnished by Dr PARSONS, who, after completing his medical studies at Edinburgh, was raised to the chair of anatomy in Oxford. Dr PARSONS deservedly attained considerable reputation as a naturalist; and it was probably this reputation which introduced him to Dunglass, the seat of Sir JAMES HALL, and where he sometimes pursued his botanical studies. He mentions *Veronica montana*, *Viburnum lantana*, *Scolopendrium vulgare*, *Crambe maritima**, *Smyrniium olusatrum*, and *Allium schænoprasum*, as occurring in that neighbourhood. All of them are plants of rarity in Berwickshire, and the two last of them have not been re-discovered by any subsequent observer. The *Botanist's Guide through Northumberland and Durham* was published in 1805; but N. Durham was just that portion of the latter county which the authors had least examined. In consequence, the stations in it are very few; but two of the plants discovered there deserve to be particularized, viz. *Chironia littoralis* and *Epilobium alsinifolium*, for the authors seem entitled to the merit of having first called the attention of botanists to them as distinct species. The discovery of the former must have proved the source of much gratification, for it was not merely new, but the chiefest ornament of the sandy fields in Holy Island, where its profusion permitted them to gather specimens more than enough, and to anticipate the pleasure they had thus to bestow on kindred minds with their own, in sharing with them a pretty acquisition to our Flora. In 1807, Mr THOMPSON'S Catalogue of Plants growing in the vicinity of Berwick-upon-Tweed appeared. Mr T. is a native of

* This has been lately re-discovered by Mr A. A. CARR, surgeon, who tells me that it grows on the shore south of Fast-Castle, near the mouth of Lumsden, or Dulaw Dean.

Berwick, and at the time of the publication of the above work, was a surgeon in the army, in which service he is now a Deputy-Inspector of Hospitals. His name is familiar to the naturalists of this country as the author of a very interesting and original work in British Zoology *; but his catalogue of plants is not entitled to much praise. In it there are enumerated 466 phænogamous species; but in this number there are included several varieties, and one or two plants which grow in places situated beyond our limits. Of the Cryptogamia there are only 98 species, and as Mr T. acknowledges he had not paid much attention to this intricate tribe, even those few cannot be safely admitted into any future catalogue without re-examination †. How far I have succeeded in supplying the deficiencies of this catalogue, and in presenting to botanists a correct view of the phytography of Berwickshire and North Durham, it will be for future researches to determine. In the mean time professional duties require that I should retire from the field, in which, a few years ago, there was scarcely another to glean, but where now several votaries of Botany pursue the same studies, and whose zeal in them, if not originated, I have reason to believe, has been kept alive and stimulated on by my exertions. I feel well assured that they will never repent they were bred in this way of study; but to prevent disappointment, I am anxious to press it upon them that the value of their adopted science consists neither in its application to medicine, nor to agriculture, nor to domestic economy, although I esteem it of some little use to those arts, but in its moral agency—in those wholesome influences on the heart and mind, which such a pursuit, not necessarily I admit, but yet almost necessarily, begets and cherishes. Were we indeed to estimate the value of a science by its tendency to promote personal happiness, Botany would, I think, merit a higher place in the scale of liberal studies than is generally allowed it; but to reap the pleasures and advantages a general and superficial knowledge of it will not

* *Zoological Illustrations*, 8vo.

† I purposely omit from this list of authors on our botany, Mr WINCH'S *Essay on the Geographical Distribution of Plants through the Counties of Northumberland, Cumberland, and Durham*, because it gives no further information relative to our immediate district than is contained in the *Guide*, of which he was the principal author. The *Essay* has been deservedly popular, and has reached a second edition—a better evidence of its merit than any critical panegyric.

suffice;—we must go beyond the puerilities of its elements, nor stop short at the difficulties opposed to further progress, for the pleasure derived from knowledge of any kind is in some degree proportioned to the labour requisite for the attainment; and they who will not endure the one cannot expect the reward attendant on success. If, however, the student will collect, by personal observation, particulars to test, and extend general views,—if he will develop the structure of plants, tracing the adaptations of one part to another,—if he will study their relations to one another, to their soils, and to their countries,—if he will indulge those feelings and moral associations which ever and anon the objects of his investigation force upon him——

—————“ The well-directed sight
Brings, in each flower, an universe to light,”—

he will reap a rich harvest of profitable knowledge; for it is not possible that less can await him who searches out the works of the Creator who made the earth to bring forth grass, the herb yielding seed, and the fruit-tree yielding fruit after his kind, and pronounced them “very good.” “The wisdom of God,” says a learned physician, “receives small honour from those vulgar heads that rudely stare about, and with a gross rusticity admire His works; those highly magnifie him, whose judicious inquiry into his acts, and deliberate research into his creatures, return the duty of a devout and learned admiration.”

CORRECTIONS.

Ænanthe crocata, vol. i. p. 69. I have just ascertained that our Berwickshire plant contains no yellow juice, in which the true *Æ. crocata* is said to abound. Our plant appears, therefore, to be the *Æ. apiifolia*, HOOKER, *Brit. Fl.* i. 123; and it agrees entirely with a cultivated specimen of that species which Mr NEILL has had the kindness to send for my examination.

Jungermannia emarginata, vol. ii. p. 63. Substitute for this *J. excisa*, HOOKER, with which *J. Funckii* is synonymous, as I learn by the *Botanicon Gallicum*.

The remark at the end of the notice of *Triplium leucanthum* (vol. ii. p. 286.) is erroneous, for the true *Trifolium officinale* grows on the sea banks a little north of the pier.

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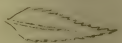
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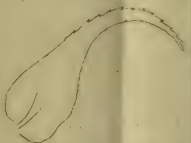
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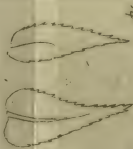
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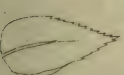
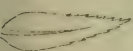
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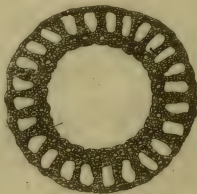
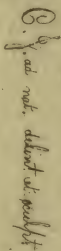
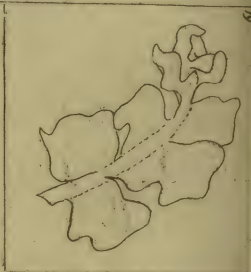
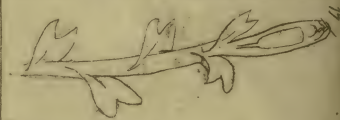
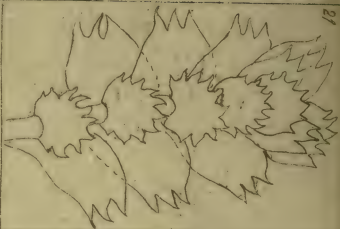
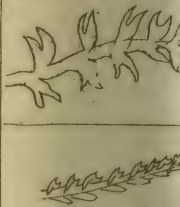
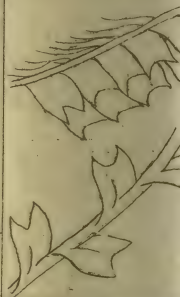
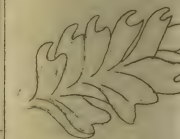
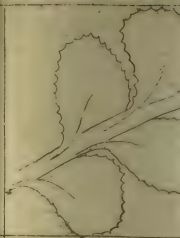
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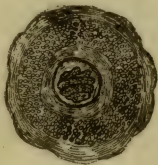
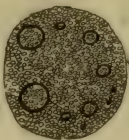
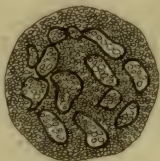
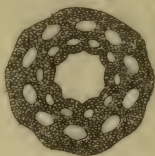
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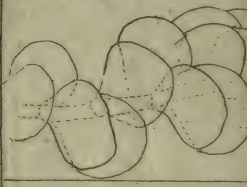
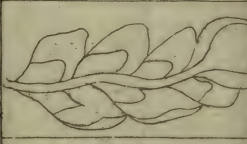
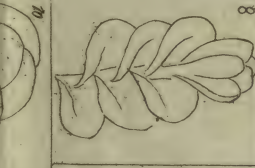
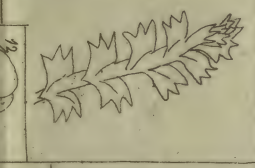
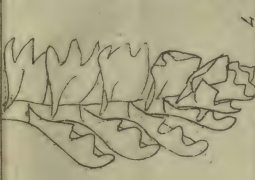
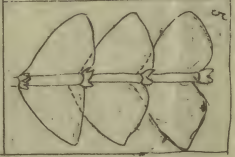
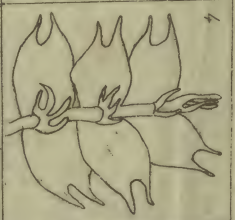
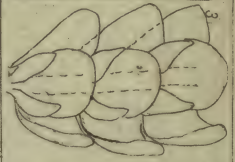
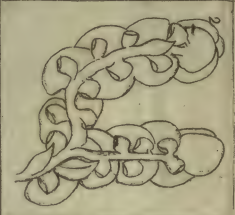
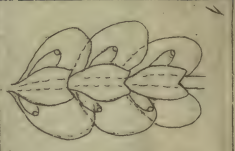
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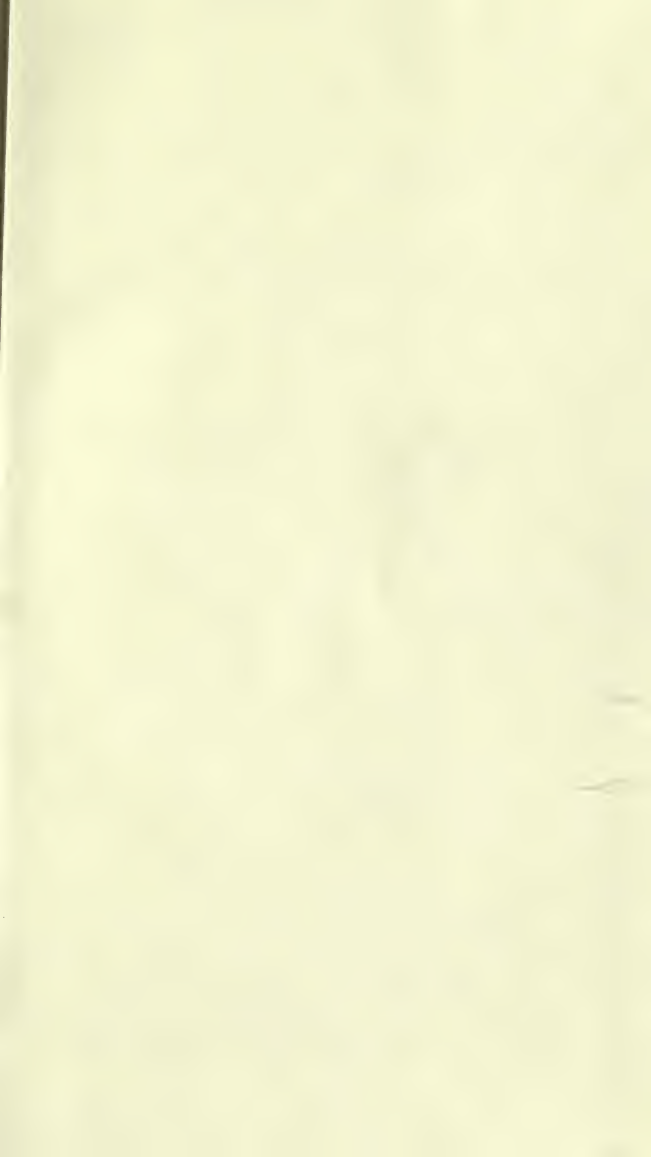
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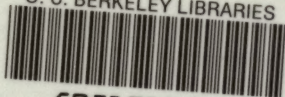
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